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World Food Trade and U.S. Agriculture, 1960-1989

Changing the Rules of Trade

1990
Tenth Annual Edition

MATRIC

Midwest Agribusiness Trade Research and Information Center
Iowa State University and the Greater Des Moines Chamber of Commerce Federation

World Food Trade and U.S. Agriculture, 1960-1989

Tenth Edition

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Abstract

Despite a tightening world grain supply situation, global grain use and trade continued slight upward trends in 1989-90. The U.S. share of trade in world coarse grain, soybean, and some livestock products increased in response to increased foreign demand, continued low foreign feed grain production, and reduced barriers to meat imports in some Pacific Rim nations. However, U.S. shares of world wheat and soybean meal exports declined due to increased foreign competition. World grain stocks dropped slightly below minimum levels considered desirable for world food security, and are expected to be at the lowest levels since the early 1970s as a percent of annual use. Stocks are tightest for coarse grains, with world trade, consumption, and prices potentially quite sensitive to weather through 1992.

Moves toward substantial easing of trade restrictions are occurring in several regions, including the EC as it moves toward 1992 unification; North America with the U.S.-Canadian Free Trade Agreements and possible negotiations toward a similar agreement between the U.S. and Mexico; movement toward market-directed economies in Eastern Europe and the USSR; and meat import liberalizations in three Pacific Rim nations. Other moves in the same direction include U.S.-USSR agreements on general trade, food processing, maritime considerations, and agricultural trade. GATT negotiations continued slow progress through mid-1990, but are expected to become more intense in late 1990 with some easing of agricultural trade barriers likely.

Other trade-related developments include progress toward biotechnology developments with the potential to significantly increase productivity in milk and pork production, and a potential encouragement for expanded use of alcohol fuels through new legislation tightening U.S. air pollution standards.

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Foreword

The Midwest Agribusiness Trade Research and Information Center (MATRIC) was established in 1987 as a cooperative effort between Iowa State University and the Des Moines Chamber of Commerce Federation. MATRIC's mission is to expand international trade in agribusiness products produced in the Midwest by small and mid-size businesses. This is achieved by improving the quality and reducing the cost of information, identifying technologies that improve competitiveness, and providing information on trade policy impacts. This report supports one of MATRIC's key objectives: the transfer and exchange of information on international markets and trade policies. MATRIC is funded by a U.S. Department of Agriculture international trade development center grant and matching support from Iowa State University and the Des Moines Chamber of Commerce Federation.

As this publication goes to press, many policy issues are nearing a critical stage of resolution. The 1990 farm legislation has been passed by the House and Senate separately, but conference decisions about the differences between the two bills remain to be resolved after decisions are made on the deficit reduction package. Deficit reduction decisions are likely to have a bigger impact on the way commodity programs are operated than the basic 1990 legislation itself.

The parties in the Uruguay Round of the GATT multilateral trade negotiations have tabled their formal offers and are entering the final stages of the negotiating process. The formerly centrally planned economies of central and eastern Europe and the USSR are at various stages of transformation in their general economic and agricultural policies.

Many of these critical policy decisions will be made during the next year and will be major factors in setting the policy environment for U.S. and world agriculture in the 1990s.

Food safety, environmental, and energy issues are moving to the forefront of the policy agenda as the new decade begins. All of these could have important effects on the food and agricultural industry and will be the focus of increased attention as the 1990s unfold. This publication will continue to focus on emerging issues that influence world trade and U.S. agriculture. We welcome comments and suggestions from readers that would improve the content and the quality of the publication. These comments can be directed to the authors or to MATRIC.

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Summary and Implications

Despite larger 1989-90 crops, global grain production fell below use during the current and two preceding trade years. The result has been a sharp decline in world grain carryover stocks, with ending 1989-90 stocks expected to drop slightly below minimum accepted standards for world food security. Global stocks declined by an estimated 179 million metric tons in the last three years, with 81 percent of the decline occurring in the U.S. as stocks were released from government programs to fill the gap between production and use. Tentative projections show little prospect for major rebuilding of stocks in the year ahead. Stocks as a percent of use were slightly below current levels in the early 1970s, and were near current levels for one year each in the mid-1960s and in the mid-1970s. Except for these four years, stocks have generally been at a significantly higher level relative to use most of the time during the last 30 years. The low stocks do not imply a major world food shortage, but they do indicate greater difficulty might be faced than in recent years in assembling substantial supplies to meet food aid needs in events of adverse weather over a large area. They also indicate world grain prices in the next few years may be more unstable than in recent years, due to reduced availability of U.S. government stocks to even out fluctuations in market-available supplies.

The downward trend in stocks reflects a slow but nearly steady uptrend in global utilization, aggressive government land-idling programs in the U.S., a decline in grain area planted in some non-U.S. regions in response to low grain prices of the mid- to late-1980s, and weather problems in parts of North and South America, Europe, and Asia.

At the same time, world grain trade trended slightly upward in the past three years, with increased imports in Pacific Rim countries and some centrally planned nations. U.S. shares of world coarse grain, beef, and poultry exports trended upward in response to reduced foreign supplies and reduced import barriers on meat products in some countries. However, U.S. shares of global wheat, oilseed, oilseed meal, and vegetable oil exports declined during the past year in response to strong international competition.

Areas where significant reductions in import restrictions have occurred or are emerging include beef in Japan, Taiwan, and South Korea, and a wide range of products, both agricultural and nonagricultural, that are covered in the recently implemented non-agricultural U.S.-Canada free trade agreement. Additionally, preliminary steps are under way to work toward a U.S.-Mexico free trade agreement that may be negotiated in the next one to two years. Along with these trends toward liberalization, the U.S. and USSR administrations, in May 1990, signed trade, maritime, food processing, and grain agreements that should encourage agricultural and nonagricultural trade between the two nations. The general U.S.-USSR trade agreement provides for granting of Most-Favored-Nation Status (MFN) to the Soviet Union, provided it is ratified by the U.S. Congress. Congress has delayed approval of the agreement, waiting for the Soviet Union to remove its barriers to emigration and to negotiate independence concerns with Lithuania. Granting of MFN status would reduce import duties and allow the Soviets to market a wide range of products more effectively in the U.S., thus increasing Soviet access to foreign exchange for purchases of U.S. products. It also would make possible the granting of U.S. government credit guarantees for grain purchases.

Along with these trade policy developments, the European Community (EC) is moving toward economic unification in 1992. Steps involved include removal of adjustments to EC price support levels that vary from country to country to compensate for strength or weakness in the currency of individual member currencies, and unification of value-added taxes within the community. Other areas to be dealt with include transportation, health, sanitation and packaging rules, and trade agreements with countries outside the EC. These policy moves will be complicated somewhat by unification of Germany and the expected entrance of East Germany into the EC.

Along with substantial trade policy changes in western nations, six of the eight East European nations in 1989 and early 1990 turned away from communism and centrally planned governments to begin the task of developing market-oriented economies. The initial impact has been modestly increased imports of grain, meat, oilseeds, and oilseed products by these nations under various EC and U.S. government export assistance programs. For the next few years, modest additional growth in demand for grain, oilseeds, and oilseed meals is possible in these nations. For the longer-term, the countries as a group may emerge as sizable net exporters of grain and livestock products and may import substantial amounts of protein meal to improve efficiency of livestock feeding.

Shifts toward a regulated market economy are under way in USSR, although, through mid-1990, the rate of change was considerably slower than in Eastern Europe. The rate of change in the Soviet economy in the 1990s is difficult to forecast and will depend on the nation's political stability, its access to capital markets, internal resistances to change, and willingness of western firms to invest in the USSR. For the next few years, its grain imports are expected to remain large and highly variable from year to year. This prospect is reinforced by the recent negotiation of a five-year U.S.-USSR grain agreement, along with similar USSR agreements with several other grain exporters. Soviet imports of soybeans and soybean meal may continue the recent uptrend as it takes steps to improve the productivity of its livestock, poultry, and dairy sectors.

China and India, the world's two most populous nations, have been sizable wheat importers in the past two years, due to growing Chinese demand and Indian weather problems. At the same time, Chinese coarse grain imports declined moderately from earlier highs in response to growing domestic demand. Future trade prospects for China are clouded by a recent partial reversal of an earlier shift in economic policies toward increased market orientation. It is expected to remain a major wheat importer in the 1990s, with a possible moderate uptrend in imports of this commodity. India likely will fluctuate from an importer to a small exporter of wheat from time to time in the next few years, in response to fluctuating weather conditions.

U.S. exports of high-value agricultural products increased considerably during the last two years, due in part to growing foreign demand and recent changes in trade policies of some importing nations. Products in this category include red meat, poultry meat, fruits and vegetables, and other processed items. Important growth markets for such products include the Pacific Rim, Caribbean nations, some other Latin American countries, and Canada.

Despite substantial market growth in several countries, economic growth continues to be restricted by large debts, relatively high interest rates, and weak currencies in a large number of developing countries. Included in this category are most of Latin America, Eastern Europe, and Sub-Saharan Africa. Future patterns in world food trade will be influenced significantly by global policies for dealing with these problem areas.

As of mid-1990, two important agricultural policy areas that will have major impacts on world agricultural trade were still in the development or negotiation phase. These were (1) U.S. agricultural policy legislation, and (2) General Agreement on Tariff and Trade (GATT) negotiations. The U.S. agricultural legislation was expected to be completed by September 1990 in order to provide basic price and income support mechanisms for major crops to replace those expiring at the end of the 1990-91 marketing year. Final GATT negotiations in late 1990 probably will be intense, with the likely outcome being an agreement to reduce global agricultural trade barriers. If that outcome is attained, it should be one of several developments encouraging further growth in agricultural trade in the 1990s.

Along with trade and economic policy developments, production trends, weather patterns, shifts toward market-oriented economies in Eastern Europe and USSR, and consumer income trends, world agricultural trade in the years ahead also may be influenced by biotechnology and U.S. environmental policies. Two emerging biotechnology developments in the livestock sector have the potential to significantly increase productivity in milk and pork production and to reduce coarse grain requirements in the pork industry. These innovations along with biotechnology developments facilitating more rapid genetic improvement in livestock may increase feed conversion efficiency, with resulting longer-term impacts on grain trade and supplies of meat available to consumers. The full potential impact of biotechnology in crop production appears to be several years away and probably will not be realized until after the turn of the century. Emerging developments in this field include development of herbicide resistant plants and the ability to transplant desirable genes from one species to another. Also, biotechnology has permitted the development of degradable plastic and offers future possibilities in developing other new industrial products from agricultural crops. U.S. environmental concerns may expand the market potential for degradable plastic in future years and also may create an expanded market for U.S. corn (maize) in the manufacture of alcohol fuels, in response to recent tightening of U.S. air pollution regulations. Thus, foreign users of U.S. corn may have to compete with moderately expanding domestic industrial demand in the decade ahead.

Introduction

U.S. agriculture is strongly and irreversibly linked to the economies and agricultural sectors of other nations through a series of developments that emerged in the early 1970s. Its financial health, growth prospects, and employment in related sectors all are heavily dependent on international trade including both imports and exports. Trade activities and economic policies of a number of large trading partners in world markets can have a direct and immediate impact on U.S. agriculture in an era of high-tech information processing and delivery where capital flows can shift among nations almost instantaneously. Likewise, economic conditions and policies in the U.S. have major impacts on producers, consumers, agribusiness firms, taxpayers, and policy makers in other nations. Global interdependence in agriculture continues to grow and will remain an important element influencing the effectiveness of U.S. agricultural policies in the decade ahead. For that reason, it will be important for decision makers and those with investments in the U.S. agricultural sector to stay abreast of global developments and their likely impacts on investment returns during the 1990s.

The decade of the 1990s will witness large changes in world agriculture, perhaps as dramatic as those of the 1970s when the U.S. dollar was released from its international gold standard, global economic growth accelerated sharply, the Soviet Union emerged as a large and continuous grain importer, and energy prices became unstable. Potential changes in the 1990s include the emergence of market economies or regulated market economies in the Soviet Union and East European nations, with potentially large effects on production, consumption, trade, and economic well-being of their citizens as well as those of their major trading partners. Major trade policy developments unfolding in the 1990s will include the expected removal of all or nearly all impediments to trade among EC nations including East Germany; a gradual removal of most restrictions on agricultural and nonagricultural trade betwen the U.S. and Canada, and possibly between the U.S. and Mexico; substantial reductions in barriers on meat and certain other agricultural products imported into Pacific Rim countries; possible reductions in barriers to trade between the U.S. and USSR; changes in U.S. sugar import and EC oilseed price support systems; and an expected global easing of restrictions on trade in a broad range of agricultural products as a result of the GATT negotiations scheduled to be concluded in December 1990.

The 1980s saw the first phase of an information processing and dissemination revolution. This change will continue to evolve in the 1990s with potential impacts on commodity futures and options pricing systems, and with potentially greater precision and speed in decision making of producers and agribusiness managers. As a result, new developments in the world situation are likely to be transmitted into the marketplace more rapidly than in the past.

In the 1990s, U.S. and world agriculture also will see the application of some of the first developments of the biotechnology revolution. Major developments in this area that appear almost certain to come into widespread use in the next few years include the application of naturally occurring hormones in milk and pork production, which will substantially increase productivity in both industries. In the dairy sector, research indicates productivity per cow may be increased by as much as one-fifth from current typical levels. That has important and as yet unknown implications for the structure of the dairy industry in the U.S. and other nations, as well as the potential to enhance the competitive position of dairy products relative to other foods. Applications of biotechnology in the pork industry have the potential to significantly reduce the quantity of grain required per unit of output, to improve the quality of the product, and to increase the competitive position of pork relative to other meats. Impacts thus may be felt in not only the pork sector, but also in the beef, poultry, grain, and oilseed sectors of world agriculture.

As global agriculture enters the new decade, world grain stocks are nearly as low as a percent of use as at the low point of the early 1970s. In addition, U.S. government programs removed more than 14 million hectares of cropland from production under 10-year contracts, and more is expected to be idled in the next few years. The long-term land-idling program will somewhat restrict the supply response of U.S. agriculture in case of a major surge of demand or further depletion of already relatively low world stocks.

These developments will bring major challenges for policy makers as well as decision makers in agricultural input, production, and marketing sectors world wide. This report is intended to show the position of U.S. agriculture in world markets at the start of the new decade, to trace the path by which it has arrived at its present position, and to point the direction of likely future changes. An additional purpose is to provide quantitative trends in major markets for U.S. agricultural products, and to provide information and analysis that will aid decision makers in anticipating and evaluating the impact of important changes in global agriculture.

1989-1990 World Food Situation: Production Below Use Third Consecutive Year, Increased Trade, Stocks Below Minimum Food Security Levels

The world food situation in 1990 reflects three consecutive years of grain production less than utilization and continued moderation of the financial stresses on global agriculture. However, serious financial problems remain among some producers and agribusiness firms worldwide. World grain production rose by an unusually large 7 percent in 1989-1990 as a result of improved weather in North America, Argentina, and parts of USSR and China. Strengthening demand, large-scale U.S. land-idling programs and less-than-ideal weather in the U.S. held production below utilization. Total global grain supplies continued to decline, but at a much slower rate than in the previous two years when major droughts sharply reduced world production. Lower production and stocks in some importing countries prompted a world grain trade increase of about 2 percent, the fourth consecutive annual increase. Aggregate trade in all grains remained 3 percent below the 1984-1985 record. Increased trade; expanded production of major crops, which offset lower prices; strong livestock and poultry net earnings; and U.S. government drought assistance were important elements contributing to the continued improvement of financial conditions for agricultural producers, farm supply and marketing firms, and agricultural lending institutions in the U.S. However, far-reaching structural changes are occurring in these industries and some segments may experience a reversal of recent financial improvements.

In the U.S., the net agricultural trade balance increased for the third consecutive year, but remained moderately below the level of the mid- to late 1970s and early 1980s. Major U.S. agricultural export assistance programs were maintained during the 1989-1990 trade year in an effort to continue the expansion in U.S. farm product exports. These programs, U.S. government grain sales, and weather problems in some foreign areas have substantially increased the physical volume of the nation's agricultural exports from the mid-1980s low point. However, foreign debt burdens, strong international competition, and slow economic growth in some areas have held the value of exports moderately below the record high of the early 1980s. U.S. policies continue to have substantial impacts on agricultural producers and handlers in the U.S. and other grain-producing nations.

Other developments in the world agricultural scene include: (1) reduced but still large costs of government farm programs in the U.S., Western Europe, and other areas; (2) continued friction between the European Community (EC) and the U.S. over export subsidies, import restrictions, and other trade policies; (3) a slight easing of the international debt problem of some oil-exporting nations; (4) reduced purchasing power and worsening debt problems in several oil-importing developing nations; (5) a modest rise in the production costs of U.S. agriculture, including fertilizer, chemicals, land rental rates, and farm machinery; and (6) slow progress through mid-year in GATT negotiations to reduce trade distorting policies.

These developments are likely to have a moderate net positive impact on the competitive position of U.S. farm product exports in the next few years. Dramatic political changes and a shift to market economies in Eastern Europe resulted in modestly expanded 1989-90 demand for U.S. farm products. Some additional demand growth in that area is possible in the next few years, especially in oilseeds and protein meal to increase livestock and poultry feeding efficiency.

Food shortages remain serious in several African countries and in parts of Latin America and southeast Asia. There is an increased challenge in meeting the short and long-term food needs of these nations partly because of lingering effects from severe drought in 1988 and 1989 and reduced world grain stocks.

Total U.S. exports of raw agricultural products and value-added items continued their recent upward trend in dollar value, despite drought-reduced supplies. However, the nation's exports of some items, such as soybean meal, soybean oil and wheat, declined partly because of strong international competition.

World Grain Utilization, Trade Continue Uptrend

Table 1 shows the world supply and utilization of all grains in 1989-90 and comparisons with recent years. Figure 1 shows the change in 1989-90 world grain exports and comparisons with the previous two and one-half decades. Preliminary data indicate aggregate world grain trade increased by 2.3 percent, or five million metric tons, with global grain trade being the third highest level on record. Increased trade reflected expanded imports by Japan,

Table 1. Combined World Production, Utilization, Trade, and Carryover Stocks of All Grains in 1989-90, Projections for 1990-91, and Comparisons with Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Utilization	Trade	Ending Stocks*	Stocks as % of Utilization
Projected					
1990-91	1732.1	1716.1	209.3	289.5	16.9
Preliminary					
1989-90	1,673.6	1,698.5	212.0	285.2	16.8
1988-89	1,559.7	1,655.0	207.2	310.1	18.7
1987-88	1,607.5	1,663.6	200.8	405.4	24.4
1986-87	1,683.1	1,653.2	187.7	461.3	27.9
1985-86	1,661.7	1,594.1	180.7	431.4	27.1
1984-85	1,646.5	1,586.2	219	362.8	22.9
1983-84	1,485.3	1,538	208	302	19.6
1981-82	1,497	1,476	211	307	20.8
1980-81	1,447	1,475	216	286	19.4
1979-80	1,428	1,440	198	315	21.9
1976-77	1,363	1,303	158	281	21.6
1971-72	1,194	1,169	110	223	19.1
1966-67	1,004	973	104	189	19.4
1961-62	813	835	83	185	22.2

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 6-88, June 1988; FG 11-89, November 1989; FG 3-90, March 1990; FG 6-90, June 1990; various other issues. includes wheat, rice, and coarse grains.

*Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

Mexico, Eastern Europe, and some Middle East countries. However, growth in trade was only slightly above the 1.9 percent average growth of the preceding 10 years. The average growth rate of the 1980s reflected substantial variability, with 3 years of declining trade and 7 years of slight to modest growth. The extremes ranged from a 17.3 percent decline in 1984-85 to an 8.8 percent growth rate in 1980-81.

In contrast, the average annual percentage growth rate of grain exports during the 1970s was 7.6 percent, with one year of declining trade and nine years of expansion. The extremes were a 22.5 percent rise in world trade in 1972-73 and a 3.6 percent decline in 1974-75. Soviet imports for 1989-90 are estimated to be down 4 percent from the previous year's level because of moderately increased 1989 wheat and coarse grain production. The decrease occurred despite subsidized U.S. and European grain exports, and slightly increased Soviet grain utilization. Soviet grain imports during the decade of the 1980s averaged 35.7 million metric tons (approximately 1.36 billion bushels) per year, with extremes ranging from a high of 54.9 million tons in 1984-85 to a low of 26.3 million tons in 1986-87.

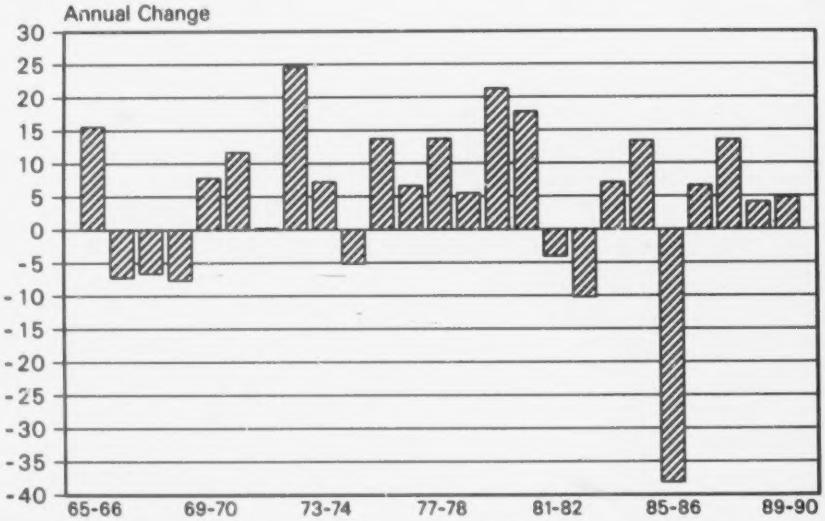
In other words, Soviet imports, despite their massive size, varied by more than 50 percent in a two year time span. The Soviet Union is by far the world's largest importer of grain and is a major element in year-to-year variability of world grain trade. Its population is 11 percent less than the European Community, but distributed over a much larger land mass. In contrast, Japan has a population about two-fifths as large as USSR and a land mass about the size of Montana, with much of it mountainous. Its average annual imports are about three-fourths as large as Soviet imports and almost always vary by less than 1 million tons per year.

World grain utilization increased modestly in 1989-90 after declining slightly in 1988-89 for the first time in 14 years. Aggregate world utilization increased by an estimated 2.6 percent, increasing per capita world grain utilization only very slightly. Grain utilization declines in 1988-89 are estimated to have occurred mainly in the exporting nations of the U.S., Canada, Argentina, and Australia where reduced supplies and higher prices brought a reduction in grain feeding to livestock. Grain utilization in 1989-90 increased slightly in most of these countries as well as USSR, East Europe, and some Pacific Rim countries. However, utilization is estimated to have declined slightly in the European Community (EC) and China in 1989-90.

World grain production in 1989-90 increased to an estimated 1,674 million metric tons, 7.3 percent above the previous season's low level and 14 percent above production 11 years earlier. The average world grain yield of 2.41 metric tons per hectare is estimated to have set new record in 1989-90, 1.7 percent above the previous high in 1986-87. The increase, however, still left production slightly below the long-term upward trend of the previous two decades and lagging modestly behind world population growth. Estimated 1989-90 global production was 0.6 percent below the previous record in 1986-87. Total production was 13 percent above the recent low point in 1983-84, despite the third smallest global area devoted to grain production in 16 years. The 1987-89 reduction in world grain plantings reflected drought in several areas, aggressive U.S. long-term and short-term land-idling programs, shifts from grain to oilseed production in South America and less intensive cropping patterns in Argentina and Australia. Grain production increased in 1989-90 in the U.S., Canada, Eastern Europe, USSR, China, India, and Argentina because of improved weather, although production in most of these areas except China and India was well below previous records. World production in 1989-90 was estimated to be 1.5 percent below utilization. This is an unsustainable situation for the longer run. The lowest practical level of global grain stocks needed to provide necessary commercial supplies is considered to be about 12 percent of annual utilization (a six week supply). Stocks would be depleted to this level in about 2.8 additional years if production falls below global utilization by the same amount as in 1989-90. The lowest level of stocks as a percentage of utilization since the early 1960s was 15.1 percent in 1972-73. An increase of about 3.5 percent in global 1990 grain production would be needed to maintain per capita world production at the 1989-90 level without reducing world stocks further.

Because production fell short of utilization, global grain carryover stocks declined again in 1989-90 for the third consecutive year. Preliminary data place world grain stocks (excluding those in the USSR, China, and certain other centrally planned

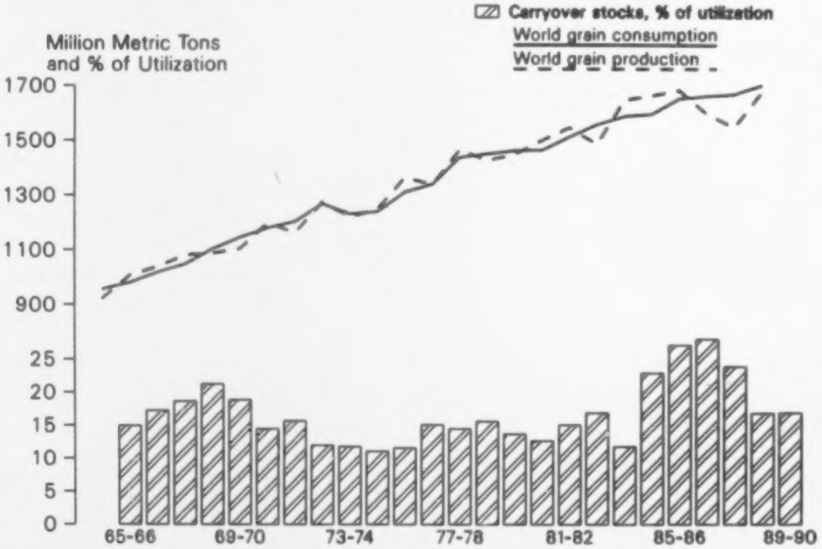
Figure 1. Annual Change in Total World Grain Trade, 1965-66 through 1989-90, in Millions of Metric Tons.



Sources: Compiled from U.S. Department of Agriculture, *Foreign Agricultural Service, Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

nations) at 16.6 percent of total annual utilization, modestly below the level some world food authorities consider adequate for world food security.[1] This is the third lowest percentage in more than two and one-half decades but is slightly above the 1972-73 low point. As usual when world utilization exceeds production, a large part of the decrease in world grain stocks occurred in the U.S. where grain stocks were withdrawn from various government storage programs. Release of government storage stocks limited the upward movement of U.S. and world grain prices in 1989-90. Because of sharply reduced U.S. government stocks, significant increases in grain prices are possible in the next two years if growing conditions are well below normal in sizable grain-producing regions of the world.

Figure 2. World Grain Production and Consumption in Millions of Metric Tons, and Carryover Stocks as Percentage of Annual Consumption, July-June 1965-66 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

Short- and Intermediate-Term Prospects

With average weather conditions, U.S. grain production in the next few years may be modestly above the 1989 level as a result of less aggressive U.S. government land-idling policies and improved yields. A return to normal weather also would increase Canadian grain production moderately from the drought-reduced 1988 and 1989 levels. Early reports indicate Soviet grain prospects for 1990 are above last year's approximately normal production, despite a strong tendency of its grain production to follow an alternating-year pattern of less favorable crops followed by favorable production. In addition, early indicators point to an increase in Australia's grain harvest in 1990-91 due to increased plantings and better rainfall. Improved crops in these areas, Europe, and Argentina would increase global grain production modestly in the year ahead. Unless widespread weather problems intervene, improved crop management practices and wider geographic application of available production technology appear likely to maintain the long-term upward trend of global grain yields and production in the 1990s. However, some climatologists note that cyclical weather patterns point to possible renewed drought in the Northern Hemisphere sometime between now and 1993.[2] A drought as extensive and severe as in 1988 would likely result in about a 3 percent reduction in global grain consumption from the 1988-89 level. A large part of the reduced consumption would come from reduced livestock herds and lower feeding rates per animal in nations where agricultural markets are determined largely by supply and demand conditions such as the U.S., Canada, Argentina, and Australia.

Without major weather problems, changes in the Soviet agricultural economic system, emerging biotechnology developments, and expanded use of currently available technology may contribute to an upward trend in global grain production. The long-term trend in production, utilization, and stocks is shown in Figure 2.

World grain consumption appears likely to continue a long-term upward trend because of world population growth, a likely long-term increase in global grain production, and modest world economic growth. Longer-term trade patterns may be affected by efforts of several major importing nations to increase grain production, thus reducing their grain import requirements. However, the trend toward increased self-sufficiency of importing nations has slowed in the past five years and may be somewhat restrained until a significant and sustained increase in grain prices occurs. Growth trends and stability of world grain trade also will be influenced by the success of recent policy changes by USSR and Eastern Europe that are designed to stimulate lagging productivity in their grain sectors.

World Wheat Stocks Decline Slightly

World wheat production increased moderately in 1989-90 after being at low levels for three out of the previous four years. However, global production in 1989-90 fell an estimated 0.6 percent below global utilization, thus resulting in a small decline in global wheat stocks. This was the third consecutive year of declining world wheat stocks in both absolute size and as a percentage of annual world utilization (see Table 2). Wheat use for livestock and poultry feed is estimated to account for slightly less than one-fifth of total world utilization.

With decreased wheat feeding, use of wheat in 1988-89 dropped below the long-term upward trend for the fifth time in the last 26 years. Preliminary data indicate last year's downward trend in wheat utilization was reversed in 1989-90, with increases in wheat utilization in the U.S., USSR, China, India, Canada, and Australia but slight declines in the EC and Eastern Europe. Global wheat utilization in 1989-90, estimated to be the highest on record, was up 27 percent from a decade earlier.

Beginning world wheat carryover stocks in 1990-91, in absolute terms, are about 15 percent above the average of the 1970-82 period, despite a sharp decline during the past three years. But when related to annual utilization, the stocks are no longer a major stabilizing influence on wheat prices as they were in the 1984-88 period. They represent approximately 21 percent of annual utilization, the second lowest level in at least 30 years and well below the 30 to 34 percent level of the 1983-86 period. Nearly two-thirds of the decline in global wheat stocks during the past four years is estimated to have occurred in the U.S., with U.S. carryover stocks down 40 million metric tons and global stocks estimated to be down 62 million metric tons. Wheat carryover stocks also are estimated to have decreased during the last four years in China, EC, Canada, Australia, India, Pakistan, and Bangledesh.

The sharply reduced U.S. wheat stocks reflect an increased U.S. share of the world wheat trade in the past three years and serious 1988 and 1989 crop problems. Wheat exports by the U.S. increased about eight million metric tons, or 30 percent, from 1986-87 to 1989-90 while total non-U.S. exports increased by an estimated eight million metric tons, or 8 percent (see Appendix V, Figure 1). Thus, the U.S. share of global wheat trade increased from 30 percent three years earlier to an estimated 36 percent in 1989-90. The increased U.S. trade share in the past three years reflected reduced U.S. wheat price support levels, and aggressive use of export enhancement or export subsidy programs. As the U.S. took steps to regain lost shares of global wheat trade, these policy actions also contributed to the heightening tension between the U.S. and the EC over trade policies and EC export subsidies. Export levels of the past three years indicate changes in U.S. farm programs are having an impact on its competitive position in world wheat trade.

Table 2. World Wheat Production, Utilization, Trade, and Carryover Stocks in 1989-90, Projections for 1990-91, and Comparisons with Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Utilization	U.S. Exports	Non-U.S. Exports	Total Trade[a]	Ending Stocks[b]	Stocks as % of Utilization
Projected 1990-91	568.2	554.1	34.0	67.0	101.0	127.9	23.1
Preliminary 1989-90	535.2	538.7	35.5	62.8	98.3	114.6	21.3
1988-89	501.4	530.5	37.8	59.7	97.5	118.1	22.3
1987-88	501.7	530.9	43.4	61.6	105.0	147.2	27.7
1986-87	530.6	522.5	28.4	62.3	91.3	176.4	33.8
1985-86	500.1	496.2	25.0	60.0	84.8	168.3	33.9
1984-85	511.9	493.0	38.1	68.9	107.0	164.1	33.3
1983-84	489.4	474.2	38.9	63.1	102.0	145.2	30.6
1981-82	449.3	449.5	48.2	53.1	101.3	112.7	25.1
1980-81	443.0	450.8	41.2	52.9	94.1	112.9	25.0
1979-80	424.6	438.4	37.4	48.6	86.0	120.7	27.5
1976-77	421.4	380.9	25.9	37.4	63.3	127.5	33.5
1971-72	351.0	342.3	16.3	35.7	52.0	90.2	26.4
1966-67	306.7	279.8	20.3	35.7	56.0	86.3	30.8
1961-62	224.8	237.9	19.6	27.2	46.8	71.7	30.1

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 10-74, April 1974; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 6-88, June 1988; FG 11-89, November 1989; FG 3-90, March 1990; FG 6-90, June 1990; various other issues. Includes wheat and wheat products.

[a] Totals may not add due to rounding.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

World Coarse Grain Production Up But Stocks Continue Decline

Global coarse grain (feed grain) production increased by an unusually large amount in 1989-90 after being curtailed by widespread drought the previous two years. Total output increased approximately 10 percent from the previous year and was 7 percent above the level of 10 years earlier but 5 percent below the 1985-86 record (see Table 3). Much of the increase in production reflected improved yields in the U.S. and Canada after the previous year's severe drought. Other countries and regions reporting increased coarse grain production last season included USSR, Argentina, Australia, and Eastern Europe. The EC's coarse grain production in 1989-90 was modestly below the previous season. Coarse grain output fell short of world utilization by approximately 3.5 percent, resulting in the third consecutive year of declining global carryover stocks. However, the decline was much smaller than the 69 million ton drop in 1988-89. The record decline in global coarse grain carryover stocks was in 1983-84, when U.S. production fell sharply as a result of drought and an extremely aggressive government land-idling program. Global stocks that year declined by about 71 million metric tons.

As in previous years of shortfalls in world production, much of the decline in stocks occurred in the U.S.[3] U.S. coarse grain carryover stocks are projected to decrease by 30 percent by fall 1990, dropping approximately 18 million metric tons below levels a year earlier and 111 million tons less than stocks three years earlier. Non-U.S. stocks in late 1990 are projected to decrease by only about seven million metric tons from the level three years earlier. With the U.S. coarse grain sector still performing most of the burden of adjusting available supplies to meet market demand, the U.S. administration has used policy tools acquired during the mid-1980s to force a major part of its excess government stocks into world markets. These tools will be discussed later in this report in a section that reviews U.S. agricultural policies.

World coarse grain consumption increased by an estimated 3.8 percent in 1989-90, partially reversing the previous year's decline in per capita consumption. Increased coarse grain utilization was reported in the U.S., USSR, Eastern Europe, and several developing nations. Increased utilization in these areas was more than offset by decreased utilization in China, Canada, Argentina, and the EC. Changes in world coarse grain utilization reflected a slight expansion in global livestock and poultry output and reduced wheat feeding because of higher-than-normal wheat prices relative to coarse grain prices. In the trade picture, U.S. coarse grain exports increased for the fourth consecutive year after a six-year downtrend in the early and mid-1980s. The U.S. trade share in coarse grains increased in 1989-90 to about 66 percent of world exports, with U.S. exports up by approximately five million metric tons at the same time that aggregate non-U.S. exports increase by less than one million tons (see Appendix V, Figure 2).

An important contributing factor in the increased U.S. coarse grain exports during the last four years was the sharp decline in U.S. coarse grain price support levels implemented in the fall of 1986 and continuing through 1990 as a result of the U.S. Food Security Act of 1985. The effective U.S. price support loan rate for 1989-crop corn (the most important U.S. coarse grain) was lowered $.90 per bushel (35 percent or $33.12 per metric ton) from the support rate for the 1985 crop. Support levels for other U.S. coarse grains were reduced similarly

Table 3. World Coarse Grain Production, Utilization, Trade, and Carryover Stocks in 1989-90 Projections for 1990-91, and Comparisons with Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Utilization	U.S. Exports[a]	Non-U.S. Exports	Total Trade[b]	Ending Stocks[c]	Stocks as % of Utilization
Projected							
1990-91	820.5	827.3	64.5	30.6	95.1	108.4	13.1
Preliminary							
1989-90	798.2	824.3	66.5	33.5	100.0	118.6	14.4
1988-89	728.3	796.9	61.3	33.2	94.5	144.7	18.2
1987-88	792.1	812.8	53.5	30.2	83.7	213.3	26.2
1986-87	833.7	807.9	47.5	36.6	84.1	234.0	29.0
1985-86	842.7	778.4	36.4	46.8	83.2	208.2	26.7
1984-85	815.8	782.6	55.4	44.9	100.3	143.9	18.4
1983-84	687.2	758.3	56.6	36.7	93.3	110.4	14.6
1981-82	766.4	741.3	60.0	37.8	97.8	150.8	20.3
1980-81	731.9	747.6	70.7	37.6	108.3	125.8	16.8
1979-80	744.4	741.9	71.0	28.5	99.5	141.5	19.1
1976-77	704.4	684.3	50.1	33.8	83.9	115.5	16.9
1971-72	626.3	609.7	24.2	25.1	49.3	104.4	17.1
1966-67	517.8	514.9	20.0	20.0	40.0	84.1	16.3
1961-62	440.5	447.5	15.9	14.1	30.0	105.2	23.5

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 10-74, April 1974; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 6-88, June 1988; FG 11-89, November 1989; FG 3-90, March 1990; FG 6-90, June 1990; various other issues.

[a] Based on market years.

[b] From 1976-77 on, the trade year is October-September.

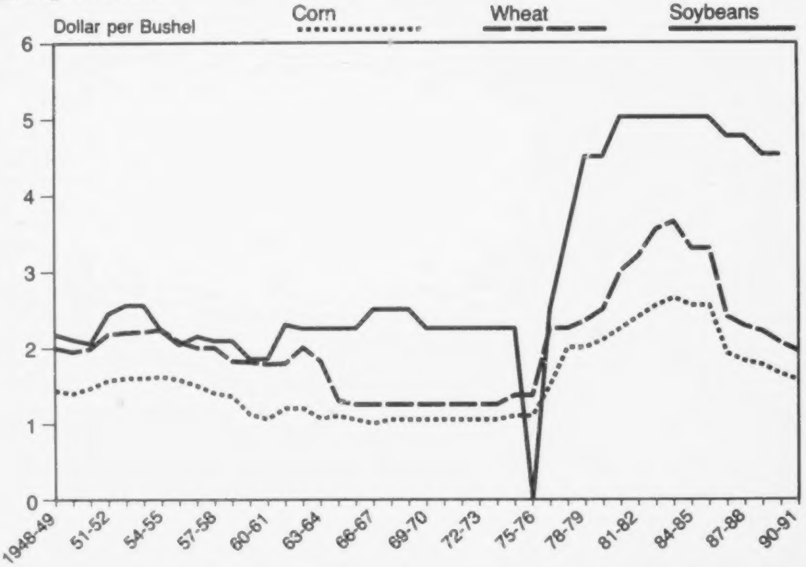
[c] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

and other policy tools pushed U.S. prices sharply below the new lower government support levels (see Figure 3) until widespread drought struck the U.S. grain belt in 1988. Because U.S. prices are a major influence on world price levels, the U.S. support level reduction has signaled competing exporters to slow the expansion of their production and may lead to modest additional gains in the U.S. share of global coarse grain trade in future years. Lower world prices than in the 1970s and early 1980s also should encourage long-term growth of global coarse grain utilization by making livestock and poultry products slightly more affordable to world consumers.

World Rice Production, Stocks Up

Global production of rice increased by 3.1 percent in 1989-90 to a new record high. That was the second consecutive year of increase after slight declines in 1986-87 and 1987-88. World rice production has been in a strong long-term upward trend, with only 7 years of declining production in the past 28 years. Production in 1989-90 was 6.7 percent above the 1984 and 1985 record and 32 percent above production 10 years earlier. The 1989-90 crop is estimated to have slightly exceeded aggregate world consumption (see Table 4). As a result, world rice stocks are expected to increase slightly both in absolute size and as a percent of annual utilization by the end of the 1989-90 trade year. Increased produc-

Figure 3. U.S. Corn, Wheat, and Soybean Price Support Loan Rates, 1948-49 through 1990-91.



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Statistics through 1961*, Statistical Bulletin No. 159 (Washington, D.C.), revised June 1962. Economic Research Service, *Feed Outlook and Situation Report*, FDS 228, April 1969; FDS 231, November 1969; FDS 241, November 1971; FDS 246, November 1972; FDS 260, February 1976; FDS 264, February 1977; FDS 268, February 1978; FDS 272, February 1979; FDS 282, August 1981; FDS 286, August 1982; FDS 292, March 1984; FDS 295, November 1984; FDS 299, March 1986. Economic Research Service, *Wheat Outlook and Situation Yearbook*, WS 277, February 1987; WS 284, February 1989; WS 288, February 1990. Agricultural Marketing Service, *Background for 1985 Farm Legislation*, Agricultural Information Bulletin No. 472, 1985; No. 497, 1986.
Note: Data on soybean price support loan rate was not available at publication date.

Table 4. World Milled Rice Production, Utilization, Trade, and Carryover Stocks in 1989-90, Projections for 1990-91, and Comparisons with Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Utilization	U.S. Exports[a]	Non-U.S. Exports[a]	Total Trade[a]	Ending Stocks[b]	Stocks as % of Utilization
Projected							
1990-91	343.4	334.6	2.5	10.8	13.2	53.3	15.9
Preliminary							
1989-90	340.2	335.5	2.6	11.0	13.6	52.0	15.5
1988-89	330.1	327.6	3.0	12.2	15.2	47.3	14.4
1987-88	313.7	319.8	2.2	9.7	11.9	44.8	14.0
1986-87	318.7	322.8	2.4	10.5	12.9	50.8	15.7
1985-86	318.9	319.5	2.4	10.2	12.6	54.9	17.2
1984-85	318.9	310.4	1.9	9.4	11.3	55.5	17.9
1983-84	308.1	304.9	2.3	10.3	12.6	47.0	15.4
1981-82	280.5	284.5	2.7	9.1	11.8	43.7	15.4
1980-81	271.6	275.8	3.0	10.1	13.1	48.0	17.4
1979-80	258.0	259.3	2.7	10.0	12.7	52.8	20.4
1976-77	237.0	238.1	2.1	8.5	10.6	37.8	15.9
1971-72	216.4	216.8	1.8	6.9	8.7	28.4	13.1
1966-67	179.3	178.7	1.7	6.1	7.8	18.6	10.4
1961-62	147.3	149.2	0.9	5.4	6.3	8.5	5.7

Source: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 6-88, June 1988; FG 11-89, November 1989; FG 3-90, March 1990; FG 6-90, June 1990; various other issues.

[a] Exports are computed on an August-July year basis.

[b] Excludes total stocks in most communist nations due to lack of published data. Stocks are an aggregate of individual marketing years and do not reflect stocks at a single point in time.

tion reflected increased crops in Bangladesh, Burma, China, Indonesia, and Japan.

World rice consumption continued its long-term upward trend in 1989-90. Global rice consumption increased every year except three in the previous two and one-half decades. The most recent year of declining utilization was in 1987-88 with much of the decrease occurring in India, the world's second largest rice-consuming nation, where severe 1987 drought reduced production.

Reported global rice stocks are projected at 53 million metric tons, 11 percent above last year's stocks. Stocks at this level are equivalent to 15.7 percent of annual utilization, about the same as in the early 1980s. Reported stocks exclude those of North Korea, Laos, Vietnam, and China, where official stocks data are not published. These four nations produce approximately 60 percent of the world's rice. Exclusion of their stocks almost certainly substantially understates world stock. In contrast to the moderate global increase, ending U.S. rice stocks in 1989-90 declined by an estimated 29 percent, the fourth consecutive annual decline. The U.S. accounts for less than 2 percent of world rice production, but normally is the world's second largest rice exporter. After Thailand and the U.S., Vietnam now ranks third in the size of its rice exports, having risen from almost insignificant exports five years ago to overtake Pakistan, EC, and China.[4]

World rice exports are projected to have decreased by about 12 percent in the 1989-90 trade year. In contrast to other grains, the U.S. share of global rice exports declined slightly in the past three years after increasing sharply in 1986-87. U.S. rice exports for 1989-90 dropped an estimated 13 percent below the 1986-87 level while non-U.S. exports decreased by an estimated 11 percent. U.S. rice exports are expected to be down 14 percent from the peak level of nine years earlier. Total non-U.S. exports are expected to be up 9 percent from 1980-81.

Among importers, decreased imports in 1990 are expected for China, EC, Indonesia, and Mexico, with increases in Brazil and a few other smaller importers. Vietnam's rice imports are projected to drop to zero in 1990 after declining steadily for the last few years.

For the longer term, world rice production and consumption appear likely to continue their nearly steady upward trend. Increased consumption will be generated by relatively rapid population growth rates in many major rice-consuming nations. Technological developments and increased application of available technology are likely to maintain the upward trend of global production for the next several years in the absence of widespread adverse weather in key rice-growing areas. Prospects for growth in world trade in rice are less certain and may be restrained by increased production in importing nations.

World Oilseed Production, Exports, Stocks Decline

Preliminary estimates indicate aggregate world production of eight major oilseeds increased by about 5 percent in 1989-90, partly because of a recovery from the previous year's severe drought in oilseed-producing regions of the U.S., Argentina, and Canada. With the increase, global production was 9 percent above levels four years earlier. Production of cottonseed, peanuts (groundnuts), and rapeseed declined from a year earlier, while output of palm kernel, soybeans, sunflowerseed, flaxseed and copra increased significantly from the previous year as a result of favorable weather and increased area planted in several major producing regions. The increase in soybean production was concentrated largely in the U.S. and Argentina, where severe drought the previous year lowered production by one-fifth from a year earlier. Production in 1988-89 increased sharply in Brazil in response to favorable weather and increased area planted. Less favorable weather, lower soybean prices, and reduced availability of government credit for input purchases reduced its production in the current year. An increase in EC production was due largely to increased plantings in southern Europe. The world cottonseed crop declined by approximately 3 percent in 1989-90, after an increase the previous two years and two consecutive years of declining production in 1985 and 1986. The smaller cottonseed crop was due mainly to reduced area harvested in China and the U.S., which was only partially offset by increased area and yields in India and Brazil. The world's leading cotton and cottonseed producers in 1989-90, in order of size, were China, USSR, the U.S., India, Pakistan, and Brazil.

Global sunflowerseed production increased by an estimated 8 percent from the previous year as a result of increased production in Argentina, the USSR, and

Table 5. World Oilseed Production, Crush, Trade, and Carryover Stocks in 1989-90 and Selected Recent Years in Millions of Metric Tons.

July-June Trade Years	Production	Crush	U.S. Exports	Non-U.S. Exports	Total Trade	Ending Stocks	Stocks as % of Crush
Preliminary							
1989-90	213.56	172.96	16.57	17.75	34.32	22.91	13.25
1988-89	202.04	165.56	14.81	16.71	31.52	21.86	13.20
1987-88	208.91	167.17	22.47	17.06	39.53	23.97	14.34
1986-87	194.30	161.37	21.26	16.42	37.68	23.47	14.54
1985-86	196.09	155.02	21.01	13.53	34.54	26.75	17.26
1984-85	191.01	150.60	17.72	15.28	33.00	21.14	14.04
1983-84	165.00	135.76	21.64	11.34	32.98	15.72	11.58
1981-82	169.35	138.33	27.14	14.27	35.84	18.89	13.66
1980-81	155.52	132.61	21.57	10.56	32.13	20.48	15.44
1979-80	170.15	133.77	26.21	9.80	36.01	19.33	14.45

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 10-89, October 1989; FOP 3-90, March 1990; *Foreign Agriculture Circular: Oilseeds and Products*, FOP 4-85, April 1985; and FOP 5-84, May 1984.

Eastern Europe. Rapeseed production expanded moderately in China and Eastern Europe, partially offsetting declines in the EC and Canada where some rapeseed area was shifted to wheat production. The EC rapeseed crop decreased by 3 percent as a result of an 11 percent decline in 1989 area harvested but with increased yields resulting from improved weather. Crop production increased slightly in response to favorable weather in the Philippines, a major producer of this product. Palm kernel production increased by an estimated 12 percent as a result of favorable weather and expanded tree plantings in the early 1980s in Malaysia.

Global exports of major oilseeds, according to preliminary projections by the U.S. Department of Agriculture, expanded moderately in 1989-90 after a sharp decline the previous year.[5] Preliminary data in Table 5 indicate aggregate 1989-90 exports will be about the same as levels four years earlier and 13 percent below the record exports of 1987-88.

World utilization of major oilseeds continued its long-term upward trend in 1989-90, with preliminary estimates showing an increase of about 4 percent from the previous year. Global oilseed utilization increased three of the past four years at a rate of 4.1 percent, moderately exceeding world population growth. However, utilization declined by an estimated 1 percent in 1988-89 as a result of drought-induced shorter supplies and sharply higher prices than in recent years. For the other three years, the expanded utilization in excess of the population growth rate reflected growing consumer incomes in rapidly and moderately developing nations and a resulting growth in demand for livestock and poultry products. The four year average annual growth rate in soybean utilization was about 2.8 percent, slightly above the world population growth rate. Preliminary estimates indicate global oilseed utilization in the marketing year just ending was 12 percent above the level four years earlier. Growth at that rate reflects an increase in world per capita utilization of approximately 1 percent since 1985-86. Of the major oilseeds, palm kernel, rapeseed, sunflowers, and peanuts have shown the strongest percentage increases in utilization in the last four years. Soybean utilization has shown a nearly steady upward trend, but at a slower percentage rate of increase. Utilization of other oilseeds has been more variable from year to year, due partly to fluctuations in supplies resulting from weather variability in major producing areas. In the years ahead, world oilseed utilization is likely to continue its long-term upward trend in response to growing consumer incomes and efforts by centrally planned nations such as the USSR and Eastern Europe to increase the efficiency of their livestock sectors.

Global carryover stocks of major oilseeds in absolute quantity at the end of the 1989-90 trade year are projected to be about 5 percent larger than carryover a year earlier. Stocks at that level would represent about 13 percent of total annual utilization, down from 13.4 percent a year earlier and the lowest since the 1983-84 trade year. Almost all of the projected increase in oilseed stocks is in soybeans, with a majority of the increase in stocks of that commodity concentrated in the U.S. Global carryover stocks of most other oilseeds are expected to decline by the end of the 1989-90 marketing year. Unlike grains, U.S. soybean exports in 1989-90 remained sharply below previous record levels, despite a moderate increase from the previous year. Aggregate non-U.S. exports continued their long-term upward trend. Increased non-U.S. exports were due largely to a sharp increase in Argentina's April-June 1990 soybean harvest and to increased carryover stocks from the 1989 harvest in Brazil.

Global production of major protein meals and vegetable and marine oils in 1989-90 increased about 5 percent from production a year earlier (see Table 6). Increases in oil production reflect expanded output of soybean, palm, sunflowerseed, coconut, olive, fish, and palm kernel oils. Most of the nonsoy products are from oilseeds high in oil content. In contrast, soybeans have a relatively low oil content and higher meal yield per ton.[6] In 1989-90, world vegetable oil stocks declined from relatively high levels of the past five years due to accelerated growth in world demand and reduced competition from butter. Declining stocks allowed soybean oil and other vegetable oil prices (in current U.S. dollars) to increase moderately in the first half of 1990 relative to those for protein meal. Global stocks of soybean oil and most other vegetable oils are expected to be at adequate but not burdensome levels at the end of the 1989-90 trade year.

For the second consecutive year, ending world protein meal stocks in 1989-90 are expected to be modestly below stocks a year earlier. However, vegetable oil stocks appear to be declining at a slightly faster rate than for meal, thus allowing oil to account for a larger share of the value of oilseeds than in recent years. With a slightly tighter supply situation in oil than in meal, 1989-90 meal prices have been well below prices the previous year and sharply below peak levels of the mid- to late 1970s. Early

Table 6. World, U.S., and Foreign Production of Oilseed Products in 1972-73, 1979-80, 1985-86, and 1987-88, through 1989-90 in Millions of Metric Tons.

	44% Protein Meal Equivalent						% Change	Fat and Oil Production[a]						% Change
	1972-73	1979-80	1985-86	1987-88	1988-89	1989-90	1972-90	1972-73	1979-80	1985-86	1987-88	1988-89	1989-90	1972-90
U.S.	17.8	27.3	25.0	28.0	25.1	26.0	46.3	7.8	10.4	10.0	10.8	10.2	10.4	33.3
Non-U.S.	35.6	58.8	75.2	81.9	82.2	86.9	144.0	30.6	41.6	51.4	54.2	55.3	57.8	89.0
World Total	53.4	86.1	100.6	109.6	107.3	112.9	111.4	38.4	52.0	61.4	64.9	65.5	68.2	77.7

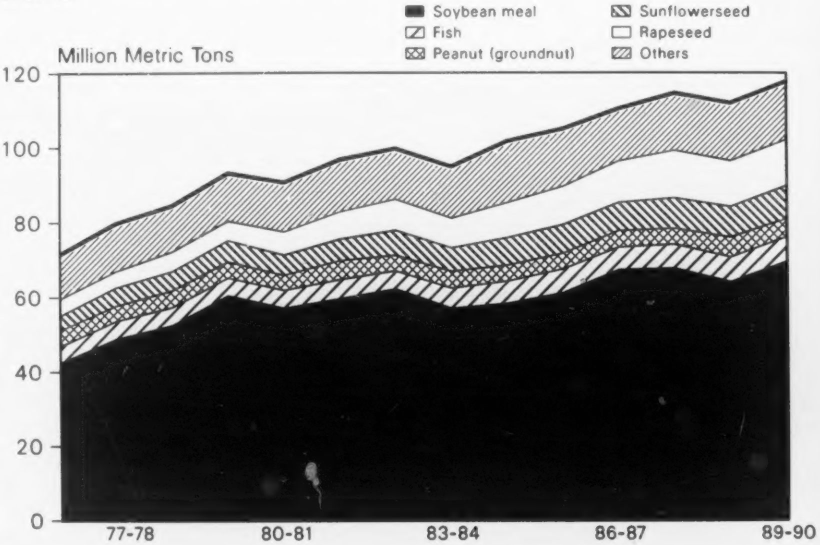
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Oilseeds and Products*, FOP 4-88, April 1988; FOP 6-89, June 1989; FOP 5-90, May 1990; FOP 25-77, December 1977; and personal communication with officials of the U.S. Department of Agriculture.
[a] Excluding linseed oil.

indications point to a continued tightening of world vegetable oil supplies in the year ahead, but with a possible moderate increase in supplies of protein meal through at least April 1991. Meal supplies after April 1991 will depend heavily on new-crop soybean production in Brazil and Argentina. Favorable weather in these two countries and possible expansion in planted soybean area could lead to an increase in meal supplies from late April 1991 onward.

As Figure 4 indicates, much of the long-term growth in world protein meal production has come from soybean meal. That pattern appears likely to continue over the next several years, with an upward trend in soybean production in South America over the longer term, and a possible small increase in the U.S., depending on final policy changes implemented with 1990 U.S. agricultural legislation. With potentially higher world wheat yields through expanded use of hybrid varieties, wheat feeding may increase in the next few years and could slightly temper the growth in demand for protein meal. Wheat has a higher protein content than coarse grains and its use in livestock rations reduces protein meal requirements. However, modest growth in the world economy and increasing demand in Eastern Europe and USSR may hold the growth in the world demand for soybean meal in the early 1990s near the level of recent years.

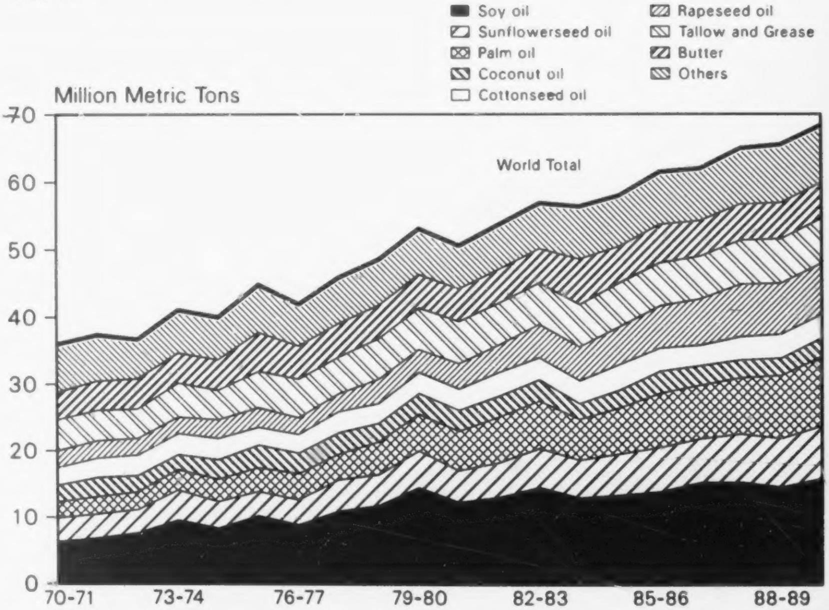
Figure 5 indicates soybean oil has faced greater competition from other products in world markets than has soybean meal. Soybean oil production continues to be larger than that of any other individual vegetable, marine, or animal fat or oil. But combined production of all other fats and oils is nearly four times as large as soybean oil production. In the years ahead, soybean meal will likely remain the dominant source of protein meal for livestock and poultry feeding. But recently expanded palm tree plantings in Malaysia and interest in similar plantings in other tropical nations suggest a significant part of the growth in world demand for vegetable oils will be supplied by palm oil during the 1990s.[7]

Figure 4. World Protein Meal Production by Type of Product, 1976-77 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues; and personal communications with officials of U.S. Department of Agriculture.

Figure 5. World Fat and Oil Production by Type of Product, 1970-71 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Long-Term Trend in World Grain Area and Yields: U.S. Area Declines Sharply

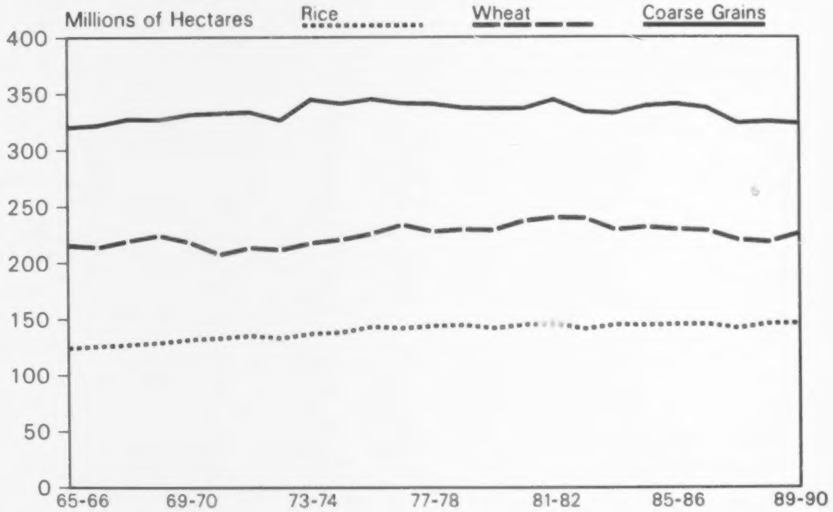
World harvested grain area in the 1980s deviated from the trend of earlier years, with the area devoted to grain declining after several decades of expansion to a peak in 1981-82. Along with a slight downward trend since the peak year, global grain area has exhibited sizable year-to-year fluctuations, the largest of which occurred in 1987-88. Total world grain area harvested in 1987-88 was 6.7 percent, or 48.8 million hectares, below the 1981-82 record, with reductions in the area devoted to each of the three major categories of grain: wheat, rice, and coarse grains. Global harvested area increased 0.5 percent in 1988-89 and 0.9 percent in 1989-90 but still remained 5 percent below the previous record. Nearly half of the decline in global harvested grain area since 1986-87 and slightly over one-third of the decline since 1981-82 can be accounted for by U.S. land-idling programs. U.S. harvested area of grain declined by 5.7 million hectares in 1986-87, 8 million hectares in 1987-88, and 3.6 million hectares in 1988-89 as government program incentives for idling cropland increased sharply. U.S. area harvested for grain increased 7.8 million hectares in 1989-90. Farmers outside the U.S. harvested 18 million fewer hectares of grain in 1987-88 than a year earlier, with world harvested area devoted to grain dropping 26 million hectares below 1986-87. However, non-U.S. grain harvested area rose by an estimated 7.4 million hectares in 1988-89 and declined by only about 1.7 million hectares in 1989-90 as foreign producers based their production plans on prospects for higher prices and improved weather. Preliminary data indicate U.S. harvested grain area will expand slightly in 1990-91 in response to improved weather and reduced government land-idling incentives.

Global grain area harvested is likely to be restrained in the next few years by continued U.S. use of long-term land-idling programs, which, at this writing, have removed nearly 15 million hectares from crop production under 10-year contracts. This program is further evidence that much of the task of balancing global grain supplies and demand continues to be done by the U.S. In the meantime, longer-term factors are likely to remain at work to slightly expand grain area in several other countries. Short-term U.S. acreage-idling programs in the next few years may take less land out of production than in recent years, depending partly on the outcome of 1990 U.S. agricultural legislation.[8] Factors behind the decades-long expansion of world harvested grain area that continued into the early 1980s included more intensive cropping practices, shifts from pasture to grain production, drainage of wet areas, increased double-cropping where climatic conditions permit, land clearing in parts of the U.S. and South America, and increased use of irrigation to convert arid or semi-arid areas to crop production. Year-to-year changes in the world's cropland base resulting from such adjustments have been small. But over three decades, the impact was sizable and contributed to the long-term upward trend in global food production. The long-term trend was interrupted in 1982-88 period, as a result of U.S. farm programs, depressed world prices, and weather problems in some areas. However, these developments may play a role in the 1990s by slightly expanding global grain harvested area. For more detail on longer term trends in harvested area of wheat, rice, and coarse grains, see the 1989 edition of this report[9] and Figure 6 and Tables 7 and 8.

U.S. Farm Programs Help Balance World Supply and Demand

In 1989-90, as in the recent past, the U.S. continued substantial short-term and long-term land-idling programs as part of an effort to help balance world production and utilization. The U.S. also continued to reduce support prices and to use large export subsidies for certain crops, especially wheat, barley, and vegetable oils, to help accomplish that objective. These policies and resulting price impacts signaled to foreign producers that expansion of grain plantings should be slowed or halted. Sharply lower U.S. government price support levels during the 1986-90 period and the heavy use of export subsidies to regain lost export market shares, while helping to reduce production and balance supplies with demand, are a sharp contrast to pre-1985 U.S. policies. The year 1983-84 is an excellent example of weaknesses from earlier U.S. unilateral attempts to balance world production and utilization solely by removing U.S. land from production. That year also provides contrasts between the global impact of current and earlier U.S. farm programs. The U.S. Payment-in-Kind program in 1983-84 reduced U.S. wheat area harvested by 23 percent as farmers received government grain in return for reducing their plantings and were allowed to graze or harvest previously planted wheat as hay. At the same time, three regions, Canada, Australia, and Western Europe, expanded their wheat area to take advantage of an expected strong increase in world prices stemming from U.S. actions. Their production response partially offset supply-control efforts of the U.S. Reduced plantings in these exporting nations toward the end of the decade were partly in

Figure 6. World Harvested Area Devoted to Individual Grains in Millions of Hectares, 1965-66 through 1989-90.



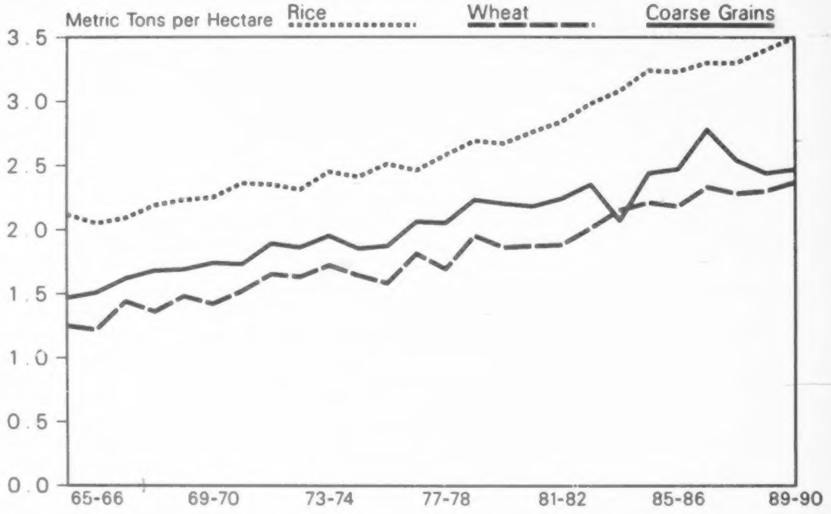
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

response to depressed world wheat prices resulting from lower U.S. price support levels and large U.S. wheat export subsidies that helped to keep world prices below U.S. levels. Net effects from these changes in U.S. agricultural policies included low world wheat prices, high farm program costs to U.S. taxpayers, and a reduction in 1987-88 U.S. and foreign wheat area. By 1988-89, these policies reduced world wheat harvested area to 9 percent below the 1981-82 record and to the lowest level since the early 1970s. These policy changes and drought in several important wheat producing areas reduced U.S. and world wheat carryover stocks sharply below the level of the mid-1980s.

Longer-Term Prospects

World grain area harvested may trend slowly upward into the mid- to late 1990s with a continuation of long-term trends toward more intensive land utilization. However, for the next two to four years, the increase in global grain plantings may be restrained by government land-idling programs in the U.S. and somewhat depressed world grain prices, which limit the incentives for expanded non-U.S. plantings. For the longer term, the greatest potential for expanded plantings appears to be in South America. Land-clearing operations in Brazil are likely to continue in future years and additional Argentine pastureland could be converted to grain production if economic incentives are adequate. With favorable economic conditions, some additional land also could be cleared and drained for crop production in the U.S. However, such land is unlikely to be brought into crop production in significant quantities unless profit margins in crop production increase sharply from current levels and until land in the 10-year U.S. Conservation Reserve land-idling program is released for production in the mid- to late 1990s. Environmental concerns also will limit the ability of such land to be brought into production in the U.S. The Soviet Union has additional land that could be brought into crop production through irrigation or drainage. Whether or not this land is utilized will depend on the priority placed on agriculture by the Soviet administration and the cost and availability of imported grain. Saudi Arabia has increased its cultivated grain area sharply in the last few years through irrigation and high grain

Figure 7. World Grain Yields in Metric Tons per Hectare, 1964-65 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

Table 7. Coarse Grain and Wheat Area Harvested in Millions of Hectares in Selected Major Producing Countries, 1989-90, and Comparisons with Recent Years.[a]

	Coarse Grains							Wheat						
Area or Country	1970-71	1981-82	1983-84	1986-87	1987-88	1988-89	Prelim. 1989-90	1970-71	1981-82	1983-84	1986-87	1987-88	1988-89	Prelim. 1989-90
W. Europe	24.0	24.4	23.3	23.1	22.1	22.4	21.7	17.0	16.4	17.0	16.6	16.8	16.3	17.1[b]
Canada	8.4	9.2	7.8	7.8	8.0	7.1	8.3	5.1	12.4	13.7	14.2	13.5	13.0	13.6
Australia	4.3	4.8	5.8	4.4	4.6	4.4	4.2	6.5[a]	11.9[a]	12.9	11.1	9.1	8.9	8.9
Argentina	7.5	6.4	6.2	4.7	4.4	3.0	3.1	3.7	5.9	6.9	5.0	4.8	4.7	5.5
S. Africa	5.5	5.3	4.8	4.9	4.6	4.6	4.3	1.9[a]	1.8	1.8	1.9	1.7	2.0	1.8[b]
USSR	43.9	58.0	61.2	58.6	59.5	57.8	55.9	65.2	59.2	50.8	48.7	46.7	48.1	47.5[b]
Total above	93.6	108.1	109.1	103.5	103.2	99.3	97.5	99.4	107.6	103.1	97.5	92.6	93.0	94.4
U.S.	39.7	43.6	32.9	41.5	35.4	32.8	37.1	17.7	32.8	24.8	24.6	22.6	21.5	25.2
Total above	133.3	151.7	142.0	145.0	138.6	132.1	134.6	117.1	140.4	127.9	122.1	115.2	114.5	119.6

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 10-74, April 1974; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-90, March 1990; *Foreign Agriculture Circular: World Crop Production*, WCP 4-85, April 1985; WCP 4-86, April 1986; WCP 12-87, December 1987; *Foreign Agriculture Circular: World Agricultural Production*, WAP 4-89, April 1989; WAP 3-90, March 1990; and personal communications with officials of U.S. Department of Agriculture, Foreign Agricultural Service.

[a] Planted area.

[b] Projected area.

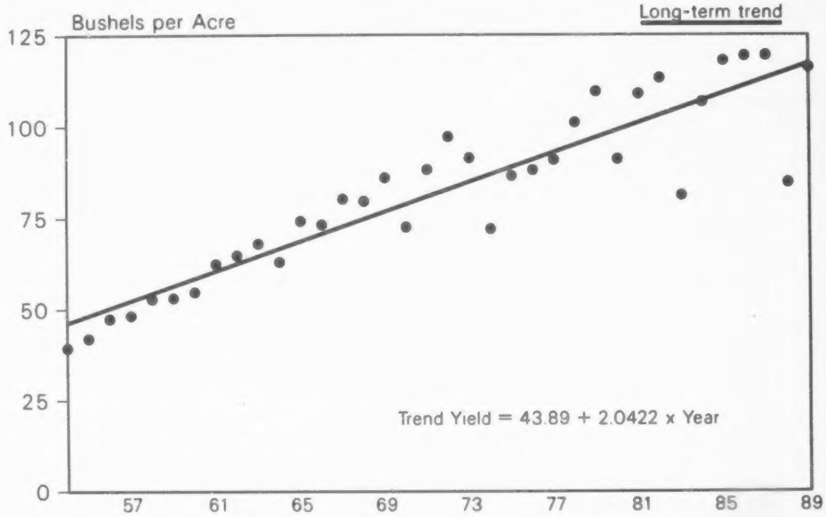
support prices. Some additional expansion in its grain area also is possible in the 1990s.

Trends in Global Grain Yields

Over the past 25 years, as shown in Figure 7, world grain yields per hectare have shown an irregular long-term upward trend. During this period, global rice yields increased approximately 77 percent, wheat yields increased 94 percent, and coarse grain yields increased 63 percent. The global average coarse grain yield declined moderately in 1988-89, due to weather problems in parts of the Southern Hemisphere, Eastern Europe, North America, and Southern Asia. However, by 1989-90 average yield recovered to the record 1985-86 and 1986-87 level. Wheat yields have been modestly below the 1984-85 record in recent years, while rice yields continued their uptrend, reaching a new record high in 1989-90.

Except for 1987 and 1988, wheat and rice yields increased at a slightly accelerated rate in recent years because of the spread of higher-yielding hybrid varieties, increased use of fertilizer, expanded use of irrigation and other technological innovations. Rice yields in 1987 and 1988 were restrained by widespread drought in India, Thailand, and neighboring countries. With favorable weather, the upward trend in global average grain yields is likely to continue during the next several years. The upward trend is likely to be due to increased applications of currently available yield-improving technology and by an ongoing development of improved varieties, better management, improved cultural practices, and other technological developments.

Figure 8. U.S. Corn Yields in Bushels per Acre, 1954-89.



Sources: U.S. Department of Agriculture, *Agricultural Statistics 1988;* Foreign Agriculture Service, *Foreign Agriculture Circular: World Grain Stiuation and Outlook,* FG 3-89, March 1989. Statistical Reporting Service, Crop Reporting Board, *Crop Production 1987 Summary,* CRPR 2-1 (88), January 1988; *Field Crops,* Statistical Bulletin No. 708, and various other issues.

Figure 8 shows the long-term upward trend in U.S. corn (maize) yields from the early 1950s through 1989. During this period, yields increased at an average rate of slightly over two bushels per acre (0.13 metric tons per hectare) per year. That trend continued until severe drought struck the U.S. cornbelt in 1988.[10] Figure 8 also shows an increased year-to-year variability of U.S. corn yields in the 1970s and 1980s when compared with the previous two decades. Greater variability of yields in recent years is believed to be due to increased year-to-year fluctuations in temperatures and rainfall in the U.S. cornbelt, rather than to characteristics of corn production technology.

Table 8. Comparative Yields in Metric Tons per Hectare of Selected Grain Producing Countries.

	Coarse Grains						Wheat					
Area	1979-80	1981-82	1983-84	1986-87	1988-89	Prelim. 1989-90	1979-80	1981-82	1983-84	1985-86	1988-89	Prelim. 1989-90
U.S.	5.70	5.71	4.20	6.12	6.10	5.97	2.30	2.32	2.65	2.52	2.29	2.20
Canada	2.63	2.83	2.68	3.21	3.26	2.83	1.64	2.00	1.94	1.77	1.23	1.79
Argentina	2.20	2.88	2.82	2.99	2.88	2.78	1.69	1.41	1.85	1.61	1.79	1.87
Brazil	1.73	1.71	1.65	1.87	1.95	1.91	0.75	1.15	1.11	1.54	1.68	1.67[b]
Australia	1.47	1.37	1.63	1.55	1.51	1.71	1.45	1.38	1.70	1.38	1.58	1.59
World	2.17	2.20	2.05	2.45	2.48	2.47	1.85	1.87	2.14	2.18	2.30	2.37[b]

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Crop Production,* WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 11, 1985; WCP 4-86, April 1986; WCP 7-87, July 1987; *Foreign Agriculture Circular: World Agricultural Production,* WAP 1-88, January 1988; WAP 2-89, February 1989; WAP 3-90, March 1990; *Foreign Agriculture Circular: World Grain Situation and Outlook,* FG 3-88, March 1988; FG 3-90, March 1990; and personal communications with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

Trends in Global Oilseed and Soybean Area and Yields

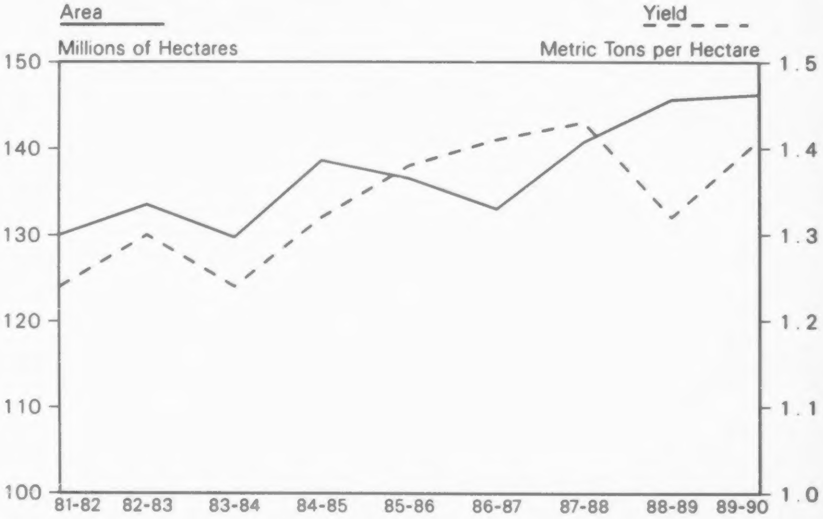
Global oilseed area harvested resumed its long-term upward trend in 1988-89 and 1989-90, after a temporary decline two years earlier. A relatively steady level of oilseed area harvested is anticipated in 1990-91 due to somewhat depressed oilseed prices. The six million hectare decline in U.S. soybean plantings from 1982 to 1987 reflected more attractive returns from production of alternative crops and idling of cropland in various government programs. With better weather and increased soybean plantings, South American soybean area increased substantially in 1988-89 and slightly in 1989-90 (see Table 9). Total world soybean area harvested in 1989-90 rose 3 percent from the previous year and was about one-fourth larger than a decade earlier. Aggregate world area harvested and the average yield per hectare of all oilseeds are shown in Figure 9, with area devoted to individual crops shown in Figure 10 and yields of individual crops in Figure 11. Harvested area and yields have exhibited a long-term upward trend with downward deviations every one to two years.

The long-term upward trend in global oilseed area reflects land clearing in Brazil, conversion of pastureland to soybeans in Argentina, shifts from small grains and pasture to soybeans in the U.S., and increased rapeseed plantings in Canada, the EC, China, and India. These trends appear likely to continue in South America in the next few years but may slow somewhat in other areas. Policy actions by the EC and India in recent years have encouraged increased self-sufficiency in oilseed production there. Growth of U.S. soybean plantings will be restrained somewhat by the long-term government conservation reserve program designed to idle highly erodible farmland for up to 10 years.

Average world oilseed yields have been in a gradual long-term upward trend for several years, as shown in Figures 9 and 11 and Table 10. That trend is likely to continue in the years ahead but will be interrupted periodically by unfavorable weather in major growing regions. The upward trend reflects higher-yielding varieties, improved production management, the gradual dispersion of available technology for weed and disease control, and improved harvesting practices to reduce field losses and quality deterioration.

Future Trends in World Soybean Production
The extent of growth in world demand for protein meal will exert considerable influence on trends in world soybean plantings during the next few years. With indications

Figure 9. World Yields in Metric Tons per Hectare, and Harvested Area Devoted to Major Oilseeds, 1981-82 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Table 9. Soybean Area Harvested in Millions of Hectares in Major Producing Countries in 1989-90 and Comparisons with Selected Recent Years.

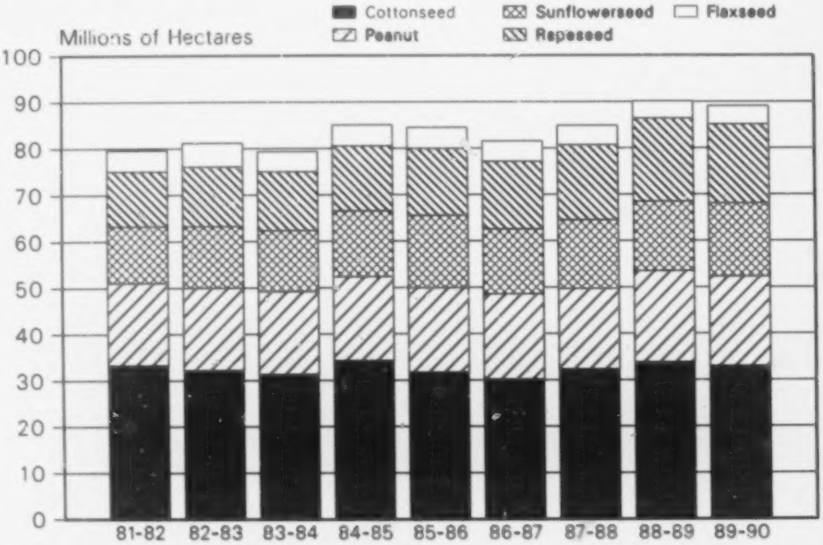
Area	1970-71	1975-76	1983-84	1984-85	1986-87	1987-88	1988-89	Prelim. 1989-90	Percent Change from 1970-71 to 1989-90
U.S.	16.7	20.8	25.3	26.8	23.6	23.06	23.22	24.03	+ 43.89
Brazil	1.3	5.8	9.3	10.1	9.3	10.52	12.17	11.30	+ 769.23
Argentina	0.03	0.4	2.9	3.3	3.5	4.26	4.00	5.00	+ 16,566.67
China	8.0	8.8	7.6	7.3	8.3	8.45	8.12	8.00	+ 0.00
Canada	0.1	0.2	0.4	0.4	0.4	0.46	0.53	0.54	+ 440.00
Paraguay	0.4	0.2	0.4	0.6	0.5	0.62	0.70	0.76	+ 90.00
Total	26.53	36.2	45.9	48.5	45.6	47.37	48.74	49.63	+ 87.07

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Crop Production*, WCP 6-82, May 10, 1982; WCP 4-85, April 11, 1985; WCP 5-86, May 12, 1986; WCP 7-87, July 1987; WCP 12-87, December 1987; *Foreign Agriculture Circular: World Agricultural Production*, WAP 2-89, February 1989; WAP 3-90, March 1990; *Foreign Agriculture Circular: Oilseeds and Products*, FOP 4-83, April 1983; FOP 4-84, April 1984; *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; and personal communications with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

of a strong long-term upward trend in production of palm oil," soybeans' comparative advantage will be in the protein sector. Unlike most other oilseeds, soybeans have a relatively low oil content and high protein meal yield. Long-term growth in protein meal demand will depend on several key variables, including global economic growth rates, exchange rates for the U.S. dollar, adjustments of developing nations to debt problems, and the trend in protein content of livestock and poultry rations in Eastern Europe and the Soviet Union, where protein content in typical rations is far below western standards. Present indications are that world economic growth will trend modestly upward, exchange rates for the U.S. dollar will remain well below previous highs for the next few years, and increased priority will be placed on the use of protein meal in East European and Soviet meat and poultry production. These factors should bring a gradual increase in soybean prices relative to those of grains, and should generate a slight upward trend in soybean plantings in the U.S. in the 1990s and a moderate upward trend in South America.

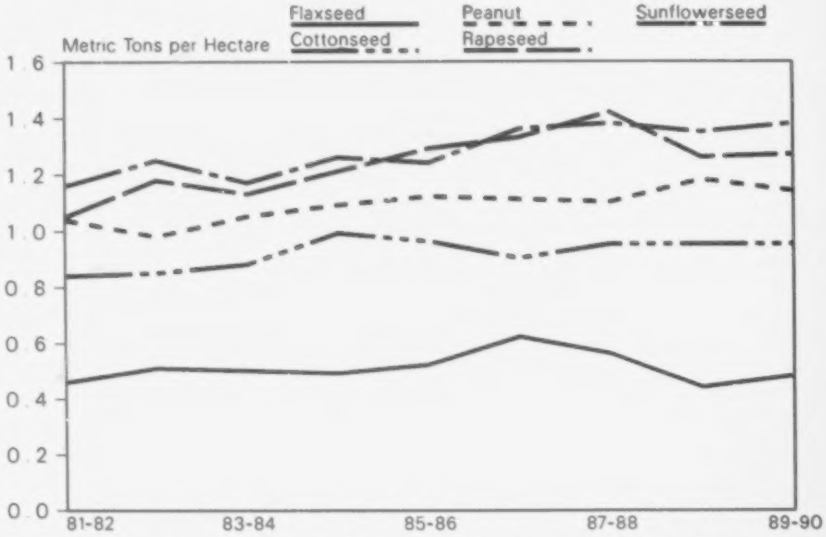
Figure 12 shows the long-term upward trend in U.S. soybean yields. Since the early 1950s, yields in the U.S. have shown an average yearly increase of 0.33 bushels per acre (0.022 metric tons per hectare). Except for occasional interruptions due to adverse weather, this trend is likely to continue during the next several years as available technology and management practices are applied to a larger portion of the planted area. Row spacings; variety selection; pest, disease, and weed control; timing of field operations; fertilization programs; tillage practices; and harvesting procedures to minimize field losses are included in this category. Similar trends appear likely in yields and application of technology and management practices in South America, China, Canada, and other soybean producing nations, given favorable weather during the planting and growing seasons.

Figure 10. World Area Harvested in Millions of Hectares of Selected Oilseeds, 1981-82 through 1989-90.



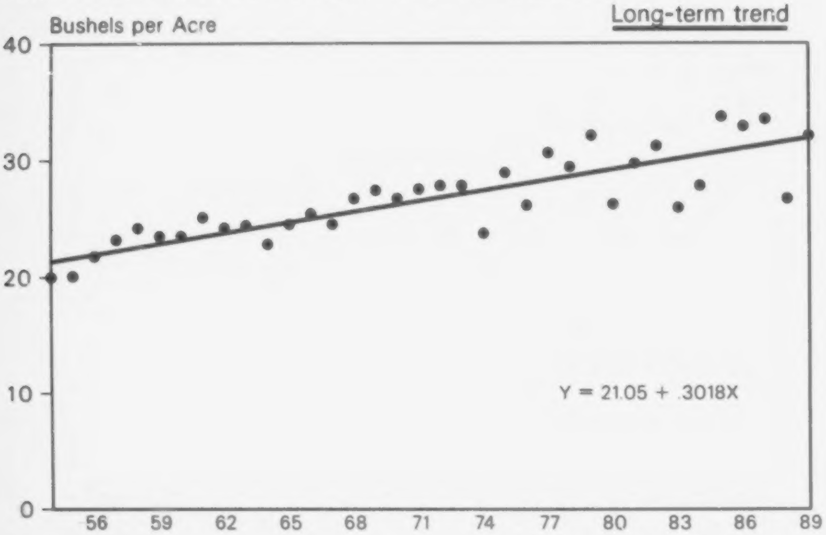
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Figure 11. World Yields in Metric Tons per Hectare of Selected Oilseeds, 1981-82 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Figure 12. U.S. Soybean Yields in Bushels per Acre, 1954-82.



Sources: U.S. Department of Agriculture, *Agricultural Statistics 1988*; Foreign Agriculture Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 3-89, March 1989; Statistical Reporting Service, Crop Reporting Board, *Crop Production 1987 Summary*, CRPR 2-1 (88), January 1988; *Field Crops*, Statistical Bulletin No. 708, and various other issues.

Table 10. Comparative Yields in Metric Tons per Hectare of Selected Soybean Producing Countries.

Area	1975-76	1979-80	1984-85	1985-86	1987-88	1988-89	Prelim. 1989-90
U.S.	1.94	2.16	1.89	2.29	2.27	1.82	2.18
Canada	2.32	2.37	2.26	2.47	2.75	2.16	2.26
Argentina	1.60	1.80	2.06	2.20	2.14	1.60	2.10
Brazil	1.72	1.73	1.80	1.49	1.73	1.89	1.81
Australia	1.73	1.83	1.75	1.34	1.74	N.A.	N.A.
World	1.65	1.82	1.73	1.86	1.92	1.71	1.88

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Oilseeds and Products*, FOP 4-78, April 1978; FOP 5-83, May 1983; *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-90,March 1990; *Foreign Agriculture Circular: World Crop Production*, WCP 4-82, April 12, 1982; WCP 3-84, March 9, 1984; WCP 4-85, April 1985; WCP 4-86, April 1986; WCP 7-87, July 1987; *Foreign Agriculture Circular: World Agricultural Production*, WAP 1-88, January 1988; WAP 2-89, February 1989; WAP 3-90, March 1990; and personal communications with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

World Livestock and Poultry Meat Production Trends

World meat production since the mid-1950s has been sensitive to trends in consumer incomes of rapidly developing and industrialized nations and has been an important influence on demand for coarse grains, protein meal, and other feed ingredients. Rising consumer incomes generally bring increased production and consumption of red meat and poultry. This trend was especially evident in rapidly developing nations in the 1960s and 1970s, but has been followed by much slower growth in global meat production in the 1980s. The recent slower growth rate reflects sluggish world economic growth, health concerns, and changing dietary trends. Slower expansion of meat production has been an important contributor to less rapid expansion in consumption of coarse grains and protein meal in the decade of the 1980s and has been a restraint on prices of these commodities.

Pork Production Down, Beef Production Up

Table 11 shows pork production trends in major producing countries during the last one and one-half decades. Preliminary projections place 1990 world production 1.1 percent lower than last year but 14 percent higher than in 1985. With world population expanding at about 2 percent per year, per capita production is decreasing slightly in 1990 but is expected to be about 4 percent above the level of five years earlier. Pork production is expected to decline slightly in 1990 in the U.S., Canada, Mexico, parts of Eastern Europe, and China but likely will be above the previous year's levels in the USSR, Japan, EC, Romania, Czechoslovakia, and Taiwan. In contrast to slightly reduced North and South American pork production in the last decade, pork production has shown a moderate long-term upward trend in the EC and the USSR and a strong upward trend in China and other Asian nations. After a substantial reduction in East European pork production in the early 1980s in response to severe debt and financial problems, that area's production rose slightly from 1983 to 1989 but is expected to decline temporarily in some countries in 1990 as the area begins the transition to a market economy.

In contrast to smaller global pork supplies, world beef production is expected to be up slightly in 1990. Increases in the U.S., Canada, the EC, Brazil, China, Australia, and USSR will offset expected decreases in Argentina, Mexico, and New Zealand (see Table 12). Global production is projected to increase 0.8 percent from 1989. Production at the projected level would be 5 percent above the level five years earlier, but would leave per capita consumption 5 to 6 percent below levels that same year because of world population growth. Areas of rapid growth in beef production in the last five years include China (up 136 percent); Mexico (up 42 percent); USSR (up 8 percent); and Brazil (up 8 percent). During the same period, decreases of 4, 2, and 1 percent were reported for the EC, the U.S., and Canada.

Continued Upward Trend in Global Poultry Production

Global poultry meat production and consumption have increased every year since 1979 in response to growing consumer incomes, consumer desire for more variety in diets, and a wider range of poultry meat products being made available by processors (see Table 13). World production in 1990 is projected to increase 4 percent from 1989. At that level, world

Table 11. Pork Production in Major World Producing Areas, 1974-78 Average, 1980, 1981, 1985, and 1987 through 1990 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1985	1987	1988	Prelim. 1989	Forecast 1990
U.S.	5.9	7.5	7.2	6.7	6.5	7.1	7.2	7.1
Other N. America	1.5	1.8	1.7	2.0	2.1	2.2	2.1	1.9
S. America	1.0	1.2	1.2	0.8	1.5	1.4	1.3	1.4
EC-12	9.0	10.3	10.7	11.2	12.1	12.6	12.4	12.5
Other W. Europe	1.1	1.3	1.1	1.2	1.1	1.1	1.1	1.1
E. Europe	6.3	6.9	6.6	6.8	7.3	7.2	7.1	6.8
USSR	5.2	5.2	5.2	5.9	6.3	6.5	6.6	6.7
Asia (Exc. PRC)	2.0	2.7	2.6	3.2	3.5	3.6	3.7	3.8
Oceania	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
China (PRC)	8.7[b]	N.A.	11.9	16.5	18.3	20.2	21.4	21.0
World Total[a]	32.2	37.0	48.4	51.6	54.7	59.1	62.2	63.3

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; *Foreign Agriculture Circular: Dairy, Livestock and Poultry Situation*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-87, September 1987; FL&P 2-88, October 1988; and FL&P 2-90, March 1990.

[a] Totals may not add due to rounding.

[b] Average production for 1976-80.

Table 12. Beef and Veal Production in Major World Producing Areas, 1974-78 Average, 1980, 1981, 1985, and 1987 through 1990 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1985	1987	1988	Prelim. 1989	Forecast 1990
				(Carcass Weight)				
U.S.	11.5	10.0	10.4	11.0	10.9	10.9	10.7	10.8
Other N. America	2.2	2.2	2.3	2.4	2.2	2.7	3.1	2.9
S. America	6.1	6.3	6.6	6.5	6.2	6.4	6.4	6.5
EC-12	7.1	7.5	7.5	7.8	8.1	7.6	7.5	7.5
Other W. Europe	0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.6
E. Europe	2.5	2.5	2.3	2.7	2.6	2.5	2.4	2.5
USSR	6.7	6.6	6.6	7.4	8.3	8.5	8.6	8.6
S. Africa	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6
Asia (Excl. PRC and India)	0.8	0.9	0.8	0.9	0.9	0.8	0.8	0.8
Oceania	2.4	2.0	1.9	1.8	2.1	2.1	2.0	2.0
Total	40.4	39.4	39.7	43.6	45.0	45.3	45.4	45.7

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; *Foreign Agriculture Circular: Dairy, Livestock and Poultry Situation*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-87, September 1987; FL&P 2-88, October 1988; and FL&P 2-90, March 1990.

production will be more than four-fifths larger than the 1974-78 average and per capita production will be up nearly 44 percent from the same time period. Production at the projected level also would be up 24 percent from five years earlier, with per capita production increasing about 14 percent in the last five years. Increased production is expected in 1990 in all major producing areas in response to growing consumer demand.

Table 13. Total Poultry Meat Production in Major World Producing Areas, 1974-78 Average, 1980, 1981, 1985, and 1987 through 1990 in Millions of Metric Tons.

Area	1974-78 Average	1980	1981	1985	1987	1988	Prelim. 1989	Forecast 1990
U.S.	5.3	6.6	6.9	7.9	9.1	9.4	10.0	10.7
Other N. America	0.8	1.0	1.1	1.2	1.2	1.2	1.4	1.5
S. America	1.0	1.8	2.0	2.2	2.7	2.7	2.7	2.9
EC-12	4.2	4.8	5.2	5.3	5.7	5.9	6.0	6.1
Other W. Europe	0.1	1.2	0.2	0.2	0.2	0.2	0.2	0.2
E. Europe	1.6	1.9	2.0	1.9	2.1	2.1	2.1	2.1
Soviet Union	1.5	2.1	2.3	2.8	3.1	3.2	3.2	3.3
Africa and Middle East	0.4	0.6	0.9	1.5	1.7	1.8	1.9	1.9
Japan	0.9	1.2	1.1	1.4	1.5	1.5	1.5	1.5
Other Asia and Oceania	0.3	0.4	0.8	1.7	2.0	2.1	2.2	2.3
Total	16.1	21.6	22.5	26.2	29.3	30.2	31.2	32.6

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; Foreign Agriculture Circular: Dairy, Livestock and Poultry Situation, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-87, September 1987; FL&P 1-88, September 1988; and FL&P 1-90, January 1990.

U.S. Shares of Wheat and Coarse Grain Trade Rise Slightly

U.S. shares of global coarse grain trade increased modestly in 1989-90 for the fourth consecutive year, while its share of world wheat trade declined slightly. These changes in world market shares followed sharp downtrends of four years for wheat and six years for coarse grains that ended in 1985-86. For wheat, the U.S. share of global exports (excluding intra-EC trade) reached an estimated 39 percent in 1988-89 and 36 percent in 1989-90, compared with 29 percent in 1985-86. The U.S. share of coarse grain trade rose to an estimated 67 percent in 1989-90, compared with 65 percent the previous year and 44 percent in 1985-86. The U.S. wheat export share reached a peak of approximately 50 percent in the early 1970s and was in an irregular downward trend from that time until 1985-86 (see Figure 13). The U.S. coarse grain export share trended up in the 1970s, surging to a peak of 71 percent in 1979-80 (see Figure 14).

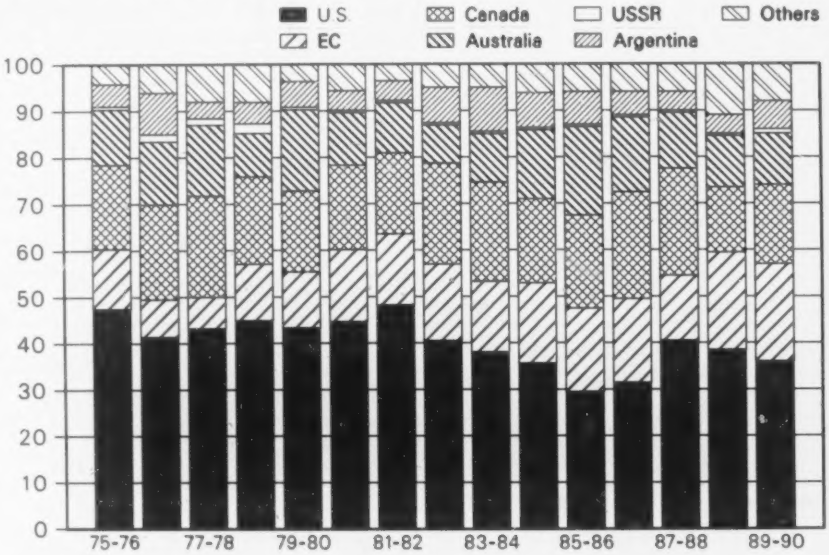
The increased U.S. trade shares in the last four years reflect declines in total non-U.S. exports of wheat and coarse grain after substantial increases in the first half of the decade. The largest decline has been in non-U.S. exports of coarse grains. The trends in the early 1980s reflected large foreign grain supplies and aggressive pricing by most other exporters. The rapid decline in U.S. trade shares in the early 1980s triggered major changes in U.S. farm price support policies and export programs that were implemented in mid- to late 1986 and continued through mid-1990.

Competition in wheat exports was especially strong recently from the EC and Canada, until Canada was struck by a severe drought in 1988 and 1989. Canada's 1988-89 share of global wheat trade dropped to 14 percent from 20 percent in 1985-86. Among other major non-U.S. wheat exporters, Argentina's trade share decreased by 0.3 percent in 1988-89 due to adverse weather and reduced production, but recovered sharply in 1989-90. The EC's wheat exports now are nearly two-thirds as large as U.S. exports, and its share of world wheat trade (excluding intra-EC trade) has increased from 18 percent in 1985-86 to its present 21 percent share. The Australian market share declined substantially in the same time period, dropping from 19 percent five years earlier to a preliminary estimate of 11 percent in 1989-90.

Long-Term Trend in Wheat Trade Patterns

From a longer-term perspective, the U.S. share of global wheat trade increased rapidly in the early 1970s as U.S. wheat

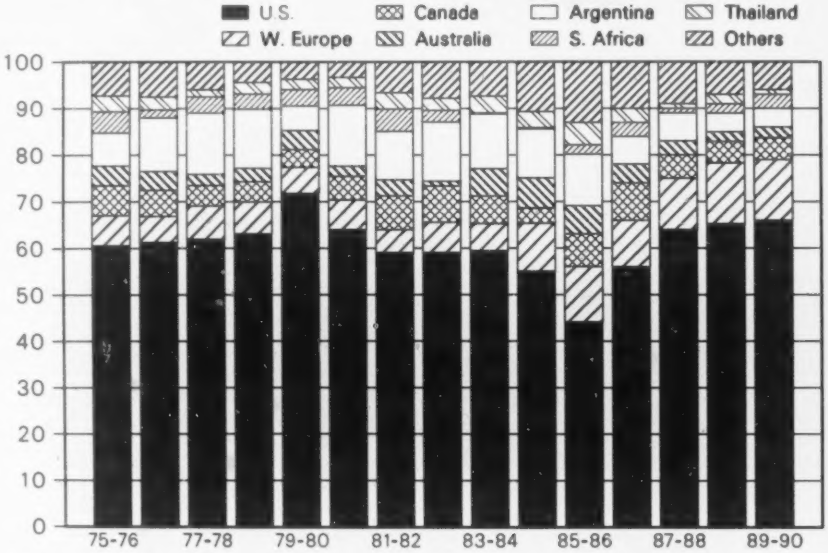
Figure 13. Percentage Shares of World Wheat Exports by Major Exporters, July-June 1975-76 through 1989-90.[a]



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

[a] From 1982-83 on, the EC is EC-12.

Figure 14. Percentage Shares of World Coarse Grain Exports by Major Exporters, 1975-76 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues. Marketing year data were accumulated on a July-June basis from 1970-71 through 1978-79. The USDA switched to an October-September fiscal year starting in 1979-80.

growers and the U.S. grain trade responded quickly to rising world demand. Profit incentives from expanded world demand, rising prices, and changing government programs brought a more than 50 percent increase in planted U.S. wheat area in only four years. A private enterprise economic system and increased grain merchandising profits quickly generated additional investments to expand U.S. grain handling and transportation capacity, enabling increased production to be moved into export markets. Along with these developments, a depreciation of the U.S. dollar increased the purchasing power of foreign buyers and improved the competitiveness of U.S. wheat relative to that of foreign competitors. Meanwhile, with a time lag, foreign wheat production began to rise due to increased use of fertilizer, higher-yielding varieties, and increased plantings in some areas. This was particularly true in the EC and Argentina, which both experienced steadily increased wheat export shares in the late 1970s and early 1980s. Trade shares of the other two major wheat exporters, Canada and Australia, fluctuated significantly from year to year due to a more variable climate and a resulting greater variability of production.

In the next few years, the U.S. appears likely to experience a stabilization or slight increase in its wheat export share. EC farm policies continue to be directed toward generating surpluses in grain production, with a price support system that encourages production, discourages consumption, and subsidizes exports. Even with substantial EC wheat feeding, a slight decrease in its internal support prices, and an optional small-scale land set-aside program, the EC is likely to offer continued strong competition in world wheat trade. In addition, Argentina has the capability of expanding its wheat production substantially, if weather and domestic economic conditions are stable. A continuation of current Argentine and world market conditions may encourage some increase in Argentine wheat production, although depressed grain prices relative to livestock may limit shifts of marginal land from pasture to wheat production. Also, Canada has taken steps to expand its grain handling and transportation capacity with the stated goal of sharply increasing its grain exports. Unless GATT negotiations bring major changes in global policies, these developments are likely to continue to be met by continued U.S. grain export assistance programs as will be noted in the policy section of this report.

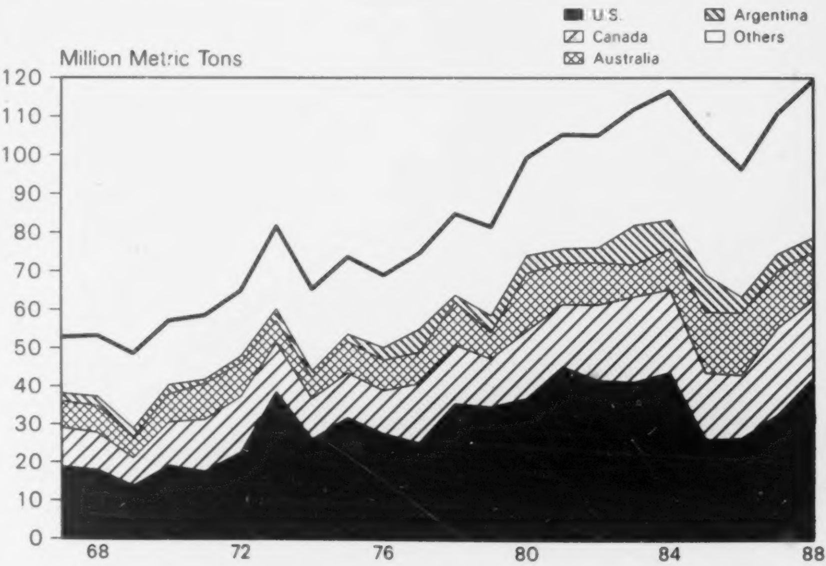
Coarse Grain Export Shares

After surging upward in 1970-80, the U.S. share of global coarse grain trade (excluding intra-EC trade) dropped to about the 60 percent level for the next four years. That was approximately the same as the U.S. trade share from 1972-73 to 1978-79. The U.S. share of world coarse grain trade declined in 1984-85 and 1985-86, reaching a low of 44 percent in 1985-86, before rising during the past four years to about 67 percent in 1989-90. The 44 percent share in 1985-86 represented the lowest U.S. share of global coarse grain exports since 1971-72. Declining U.S. corn and coarse grain trade shares in the early 1980s reflected an increasing share of global exports from Western Europe, and continued corn and sorghum exports from China (included in the "Others" category in Figure 14). The increased U.S. coarse grain export share from 1986-87 and through 1989-90 reflected sharply lower U.S. corn prices as a result of changes in American farm and trade policies. It also reflected serious weather problems in parts of the Southern Hemisphere, Eastern Europe, Canada, and South Asia at times during this period and growing Chinese demand for grain, which reduced that country's exportable supply of coarse grains.

South Africa's corn crop was struck by severe drought in 1983, 1984, 1987, and 1988, which sharply reduced that nation's exports. Somewhat improved weather and increased 1985, 1986, and 1989 production allowed South Africa to resume corn exports in those years, although exports were below earlier peak levels. Its production declined again in 1990 as weather conditions turned less favorable, resulting in another decline in its export share. As shown in Figure 14, export shares of most other major coarse grain exporters including Canada, Australia, Thailand, and Argentina varied considerably from year to year. These nations normally do not carry reserve grain stocks. Thus, weather fluctuations are a major factor behind year-to-year variations in their shares of world coarse grain trade.

Figure 17 shows the dramatic rise in U.S. corn exports in the 1970s, while non-U.S. exports during the same period remained relatively stable. From 1979-80 to 1985-86, however, U.S. corn exports fell by 50 percent while corn exports from all other nations, as a group, rose by over 80 percent. The sharp decline in U.S. exports brought severe financial pressures to U.S. grain producers, grain and farm supply firms, the U.S. grain transportation industry, and port elevators. Since 1985-86, corn exports by non-U.S. exporters as a group have fallen by about 43 percent, due largely to reduced exports from China, Thailand, Canada, and Argentina.

Figure 15. World Wheat Exports by Country of Origin, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

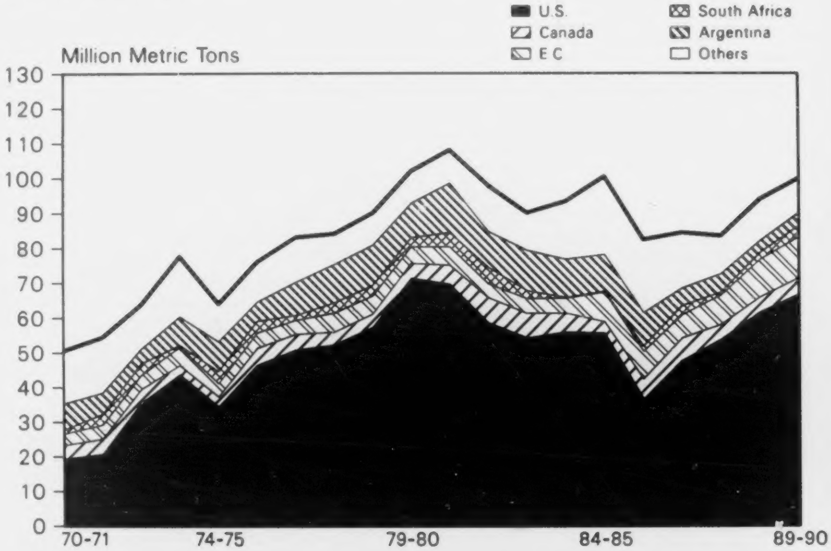
Prospects for the U.S. share of coarse grain exports in the next few years remain somewhat uncertain and will depend on: (1) U.S. price support, grain reserve, and acreage control policies; (2) exchange rates of the U.S. dollar against foreign currencies; (3) Soviet grain production and consumption; (4) world economic growth rates; and (5) weather in major U.S. and foreign coarse grain exporting areas. At this writing, barring prolonged weather problems, demand indicators point to slightly increased global coarse grain exports through the mid 1990s. If this proves correct, U.S. corn and coarse grain exports in the next few years are likely to continue to face significant but less intense foreign competition than in the mid-1980s. Changing U.S. farm policies should help to at least slightly increase the U.S. share of world coarse grain trade from the already strong recovery that has occurred through 1989-90.

In the event of a sharp upturn in world trade, U.S. corn and coarse grain exports almost certainly could be increased more rapidly than those of foreign competitors, with a resulting increase in the U.S. trade share. Unlike most other coarse grain exporting nations, the U.S. has substantial excess handling and exporting capacity, a large amount of land currently being idled from production, and modest reserve grain stocks that could be used to meet expanding world demand.

Figures 16 and 17 illustrate that U.S. corn and coarse grain exports continue to be of major importance to foreign livestock industries. U.S. corn exports now account for 8 out of every 10 tons traded in world markets and slightly more than half of all coarse grains moving into international trade. These grains are used primarily for livestock and poultry feed in industrial and rapidly developing nations.

Other major coarse grain exporters include Argentina, France, Canada, China, South Africa, and Thailand. Despite policies intended to encourage Brazil to return to its former corn export position of the 1960s and early 1970s, it has remained a net corn importer during most of the 1980s. Recent performance suggests Brazil is likely to have difficulty maintaining a net export position in corn on a consistent basis during the next few years. Restraints on Brazilian production potential include more attractive alternatives in competing crops, high costs of fertilizer and other purchased inputs, and difficulties of accumulating capital and financing production in a high-inflation economy.

Figure 16. World Coarse Grain Exports by Country of Origin, Trade Years 1970-71 through 1989-90.[a]

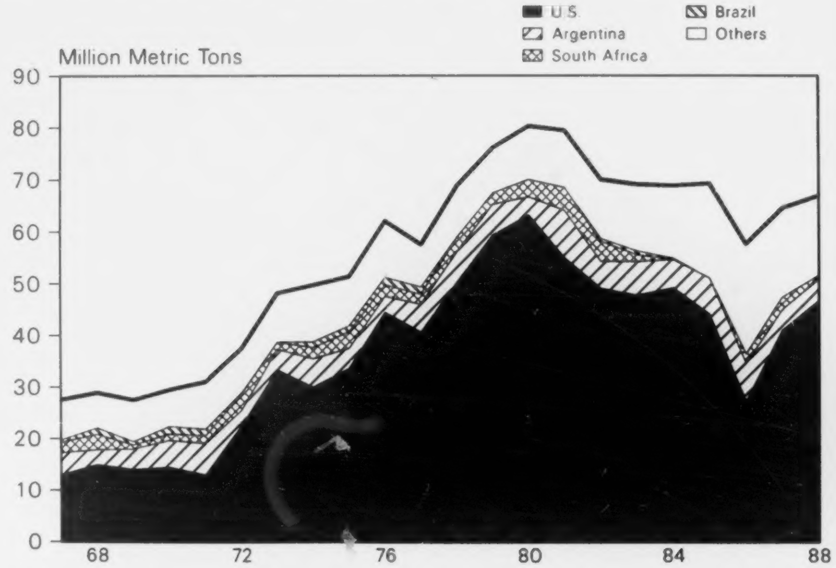


Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; various other issues.

[a] Trade data in this table are on a July-June trade year through 1980-81. From 1980-81 on, the trade year is October-September.

[b] Trade data as expressed in this table exclude intra-EC trade.

Figure 17. World Corn Exports by Country of Origin, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Soybean and Soybean Product Trade Shares

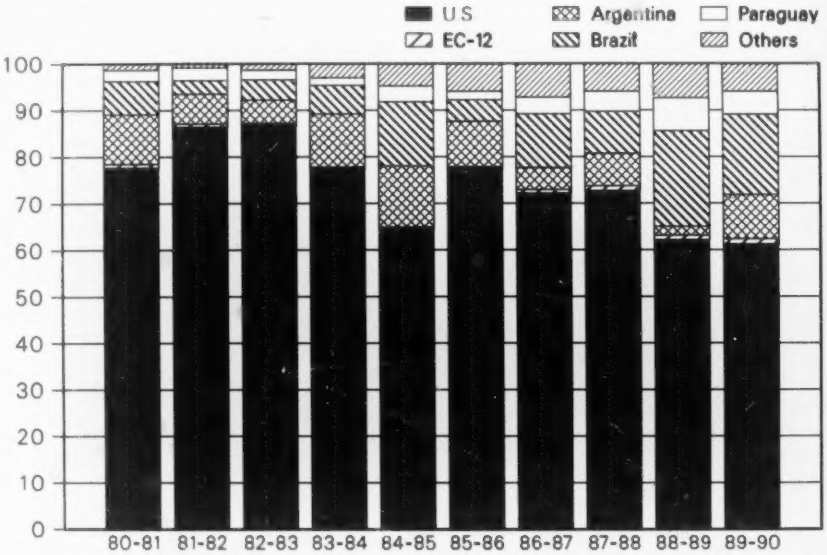
Soybeans

The U.S. share of global soybean trade has been somewhat variable in recent years. It declined substantially in 1983-84 and 1984-85, turned upward in 1985-86, but declined again in 1986-87, 1988-89, and 1989-90 (see Figure 18). Preliminary data place the current U.S. share at 61 percent, down from an average of slightly more than 80 percent in the 1975-76 through the 1983-84 period. The recent decline in the U.S. share of global soybean trade has resulted from increased exports by Argentina, Brazil, and Paraguay. Other contributing factors behind the decline include the strong U.S. dollar in the 1981-89 period relative to South American currencies and U.S. price support programs that have tended to restrict the competitiveness of U.S. soybeans in international markets and in competition with other major crops for U.S. cropland.

U.S. soybean and soybean meal exports are affected by a wide range of factors. For example, much of the decline in U.S. and world exports in 1983-85 reflected reduced demand for soybeans and soybean meal in Western Europe. Factors contributing to that area's reduced demand included: (1) an aggressive EC program to reduce surplus dairy production, (2) increased wheat feeding with a resulting decline in protein meal needs since wheat has a higher protein content than corn (maize), (3) stabilization of other EC livestock and poultry production, (4) large imports of U.S. corn gluten feed and meal as an alternative protein source, and (5) a sharp increase in EC oilseed production. In addition, the U.S. dollar, at times, has placed U.S. soybeans and meal at a competitive disadvantage relative to foreign supplies and debt problems have restrained demand growth in Eastern Europe and developing nations. These restraints on world soybean exports eased somewhat from 1985-86 through 1987-88, but re-emerged in 1988-89 as the cost of imported soybeans and soybean meal increased sharply in response to a major U.S. drought. In 1989-90, the slight decline in U.S. soybean export share reflected sharply increased South American competition a condition that is likely to continue through at least the first quarter of 1991.

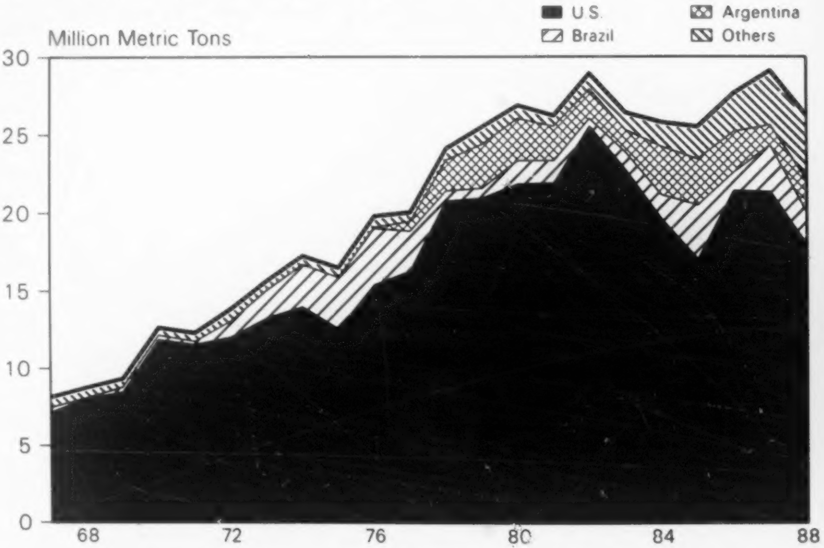
U.S. price support programs and the extent of growth in foreign demand for beans and meal will strongly influence the U.S. soybean trade share in the next few years. With modest growth in world demand and no major changes in price supports, the U.S.

Figure 18. Percentage Shares of World Soybean Exports by Major Exporters, October-September 1980-81 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Figure 19. World Soybean Exports by Country of Origin, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

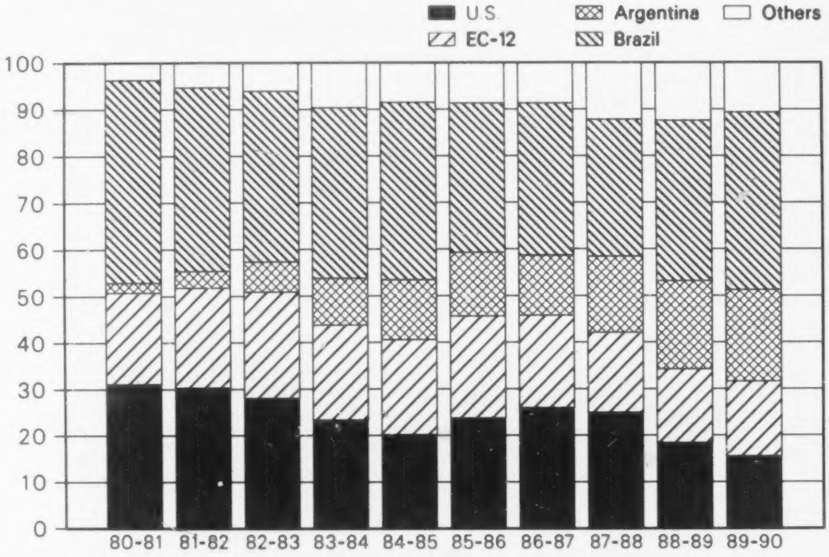
trade share is expected to remain under pressure from South American competition. But with accelerated demand growth and/or substantially restructured U.S. price support programs, U.S. producers probably would be able to expand production more quickly and more aggressively than their foreign counter parts, thus increasing the U.S. share of world trade.

Figure 19 shows the long-term trend in exports of soybeans by the U.S. and other exporting nations, including the expanded South American exports and sizable year-to-year fluctuations in global exports. World soybean trade has experienced some brief periods of decline, but has shown a remarkable capacity to rebound when global economic growth resumes its upward trend or when supplies recover from drought-reduced levels. Increasing consumer incomes are closely linked with increased demand for livestock and poultry products and have a strong tendency to generate demand for protein meal. Soviet and East European agricultural policies, including a priority on protein meal imports, are additional influences on future export trends (see USSR and East European sections of this report). Because the average protein content of livestock and poultry rations in those areas are far below Western standards,[12] and considering the agricultural background and training of the current Soviet leadership, it appears likely that soybean and/or protein meal imports by the USSR will increase significantly in the next several years. A moderate increase in exports of meal to Eastern Europe also is likely if financing for purchases can be arranged.

Soybean Meal

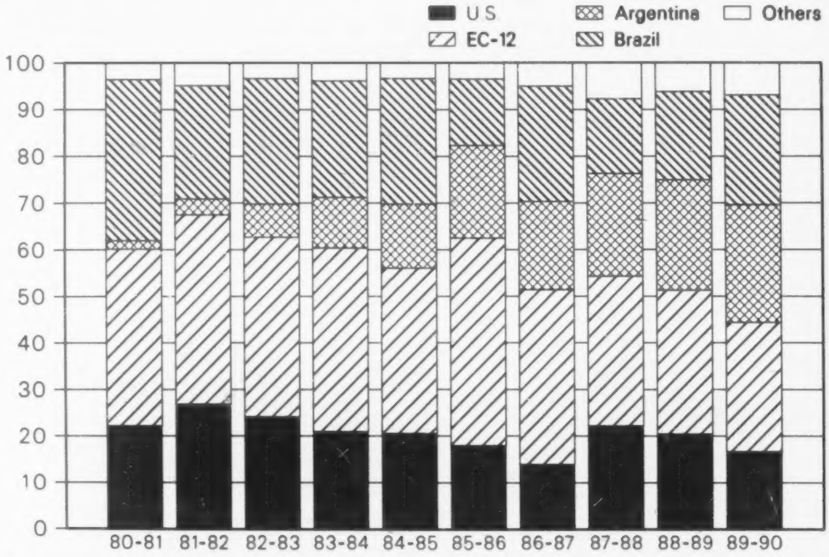
The U.S. export share of world soybean meal exports temporarily stabilized from 1985-86 to 1987-88, after trending downward in the early part of the decade (see Figure 20). However, the U.S. share of global soybean meal trade again dropped sharply in 1988-89 and 1989-90 as a result of drought-reduced U.S. supplies and a record South American soybean crop. While over three-fifths of the soybeans traded in world markets are produced in the U.S., less than one-fifth of the soybean meal traded in world markets originates from U.S. processing plants. With strong foreign competition and sluggish global demand for protein meal, U.S. soybean meal exports in 1984-85 dropped below those of both the EC and Brazil for the first time. U.S. exports moved moderately above those for the EC until 1989-90, when they again fell below

Figure 20. Percentage Shares of World Soybean Meal Exports by Major Exporters, October-September 1980-81 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; FOP 3-90, March 1990; various other issues.

Figure 21. Percentage Shares of World Soybean Oil Exports by Major Exporters, October-September 1980-81 through 1989-90.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-89, March 1989; various other issues.

that area's level. In 1989-90, U.S. soybean meal exports were only about two-fifths as large as Brazil's soybean meal exports and three-fourths as large as Argentina's. Argentina has expanded its soybean processing capacity in recent years and additional capacity expansions are likely in the years ahead as it attempts to capture value-added markets. A sizable percentage of the soybeans processed in the EC are of U.S. origin, since climatic limitations have kept that area's domestic production at extremely low levels. Spain and Portugal account for much of the soybean meal exports in the "Others" category of Figure 20 for years prior to 1986-87. Since 1986-87, they are included in the "EC" category. These nations joined the EC on January 1, 1986.

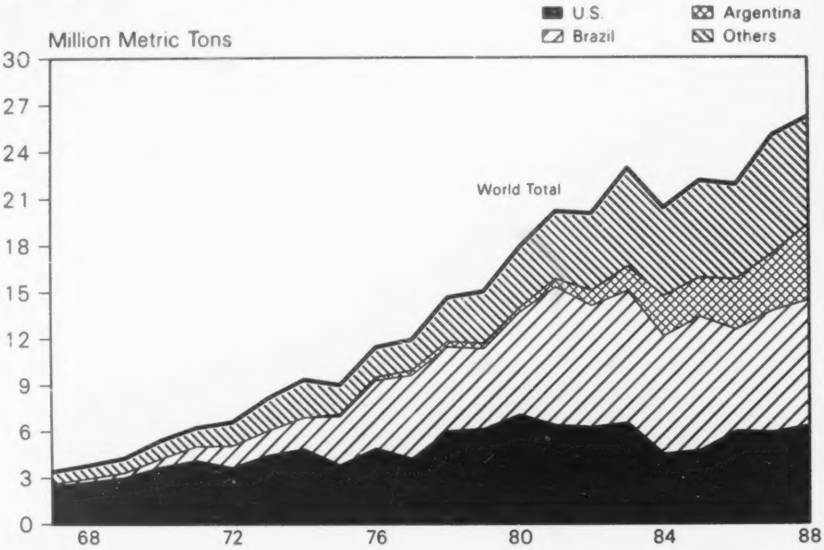
From a longer-term perspective, Brazil's share of world soybean meal exports fluctuated from year to year due to variations in its production, but with a modest upward trend. However, the largest part of the decline in the U.S. soybean meal trade share since the late 1970s has come primarily from the EC (including Spain and Portugal) and from Argentina. Increased trade shares by these areas reflect their governments' policies, which are designed to encourage exports of value-added products such as soybean meal and soybean oil. Value-added exports enable processing nations to benefit from increased domestic employment and to retain any profits resulting from processing operations. Policies used to encourage such trade patterns include larger export taxes on beans than on bean products in South America and modest import taxes on soybean oil in the EC nations.[13]

Trade policies of these competing meal exporting nations are strongly entrenched. With excess world processing capacity, the U.S. soybean processing industry is likely to face intense competition in its efforts to maintain or expand its share of global soybean meal trade. In contrast to U.S. soybean export shares, the excess foreign processing capacity would make it difficult for the U.S. meal trade share to rebound sharply even in case of a strong recovery in world soybean meal demand.

Soybean Oil

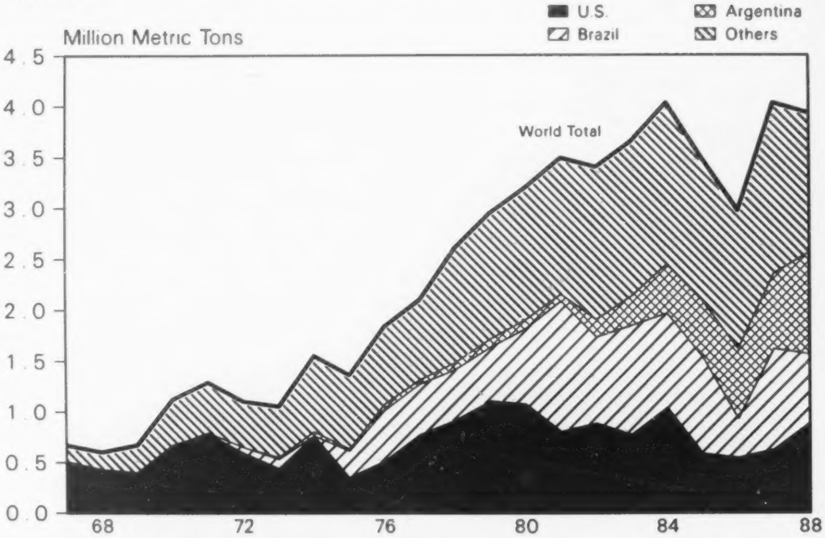
The U.S. share of global soybean oil exports has followed a pattern similar to that for soybean meal, except the soybean oil share declined moderately in 1986-87,

Figure 22. World Soybean Meal Exports by Country of Origin, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

Figure 23. World Soybean Oil Exports by Country of Origin, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), various issues.

rebounded sharply in 1987-88 with expanded U.S. government export assistance programs, and then declined in 1988-89 and 1989-90 with increased foreign competition (see Figure 21). The U.S. ranked fourth in soybean oil exports in 1989-90, behind Brazil, Argentina, and the EC. Argentina's share has increased rapidly since the early 1980s as its soybean production and processing capacity expanded. The EC share of world soybean oil exports has declined moderately since the mid-1980s as a result of growing South American competition. Future competition from EC and Brazilian processing industries will depend heavily on trade policies of those areas and on trends in Brazilian soybean production and domestic soybean oil consumption. Recent GATT decisions have determined that EC oilseed policy violates GATT trade rules. As a result, some change in EC policies may occur, affecting both its oilseed production and its processing industry. With no major changes in trade policies, U.S. soybean oil exports are likely to continue to face strong competition in the years ahead.

Figures 22 and 23 show exports of soybean meal and oil by major exporters since the mid-1960s. World soybean meal and oil trade patterns show only slightly increased U.S. exports over this time period and sharply expanded exports by Brazil, Argentina, and other nations. The "Others" categories in Figures 22 and 23 consist mainly of the EC (including Spain and Portugal). U.S. and South American soybeans are processed in EC countries and a portion of the resulting meal and oil production is re-exported. This pattern indicates the U.S. soybean processing industry has been denied participation in much of the growth in world demand for its value-added exports. It also helps explain increasing concern in the U.S. about foreign oilseed processing policies.

Trade Shares in Livestock Product Exports

Beef and Veal Exports

The U.S. share of world beef and veal exports has increased over the past 15 years. That trend is expected to continue into the early 1990s as a result of liberalization of Japanese beef import policies. U.S. beef and veal exports now represent nearly 10 percent of world trade, including intra-EC exports. As shown in Figure 24, that compares with a U.S. trade share of only 0.8 percent in 1973. Despite the upward trend, U.S. beef exports are much smaller than exports from Australia and the EC. However, U.S. beef exports in the past three years have moved ahead of Argentina, Brazil, and New Zealand. The U.S. is expected to be the third largest beef exporter in 1990 with its exports up 260 percent from five years earlier. Growth in beef exports represents expansion in an important value-added market for the U.S. that creates jobs in the cow-calf industry, cattle feeding, processing, transportation, and supporting input industries.

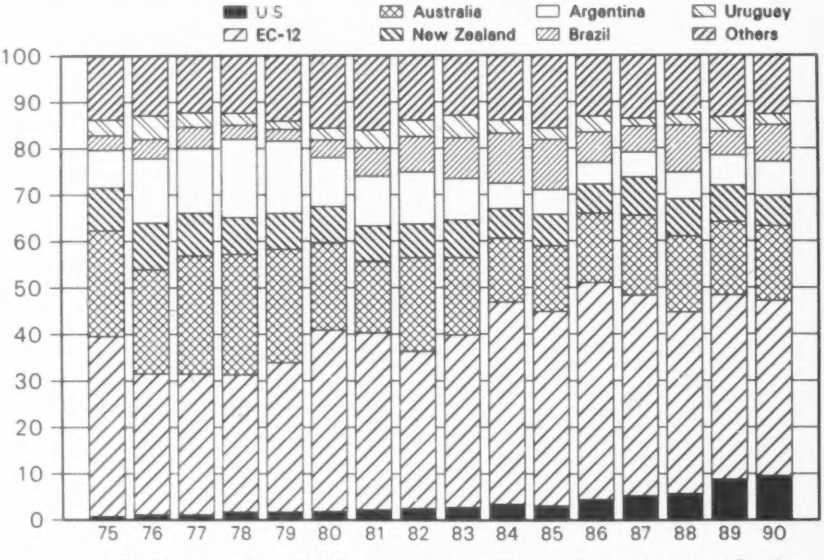
In mid-1989, the U.S. and Japan entered into a beef and citrus agreement that permits a significant expansion in Japanese beef imports in the next few years. Japan's global beef import quota will increase from 214,000 metric tons in fiscal 1987-88 to 274,000 tons in 1988-89, 334,000 tons in 1989-90, and 394,000 tons in 1990-91. That is an 84 percent increase in the beef import quota by 1990-91. In April 1991, all quantitative restrictions on Japanese beef imports will be removed. During the 1988-91 period, Japan's beef imports will have a 25 percent tariff with reductions in other import charges. In April 1991, the tariff is scheduled to rise to 70 percent with reductions to 60 percent in 1992-93 and 50 percent in 1993-94.[14] These changes are expected to sharply increase Japanese beef imports, and a large part of the increased imports is expected to be supplied by the U.S. and Australia. In addition, U.S. beef exports to Canada have trended strongly upward in recent years and contributed to growth in total exports. The U.S. is the leading supplier of imported beef to Canada and accounted for approximately 38 percent of all Canadian beef imports in 1988. In 1980, the U.S. supplied only 11 percent of Canada's beef imports.[15] Major non-U.S. exporters of beef in expected 1990 order of size include the EC, Australia, Brazil, Argentina, New Zealand, and Uruguay. The substantial long-term growth in EC's share of world beef exports since 1973 has come largely at the expense of Argentina, Uruguay, and New Zealand. However, since 1985 the EC share of world trade has dropped from 42 percent to an expected 38 percent in 1990. Sizable yearly fluctuations in exports from Australia and Argentina reflect an unstable climate in those areas, with herd liquidation tending to increase supplies and depress prices during drought years. When pasture and range conditions are favorable, producers tend to retain animals to rebuild herds, resulting in a temporary decline in beef supplies and exports.

Australia was in a herd reduction phase from 1986 to early 1988, but is expected to expand cattle inventories in the next few years if favorable rainfall and pasture conditions continue. Argentina's long-term decline in export share at least partially reflects that country's increased emphasis on wheat, corn, sorghum, sunflowerseed, and soybean exports as sources of foreign exchange earnings to help service its large external debt. However, the decline in that nation's beef exports appears to have ended, with its export share increasing slightly since 1988.

Pork Export Shares

The EC is the world's largest pork exporting area, as shown in Figure 25. If intra-EC exports are included, its exports since 1970 have accounted for 61 to 77 percent of world pork trade. Excluding intra-EC trade, its share of global pork exports in recent years fluctuated from 16 to 24 percent. The EC's share of global exports has trended slightly downward since the mid-1970s. During the same period, Canadian, Taiwanese, Chinese, and East European export shares have increased slightly. U.S. pork export shares reached a peak in 1976 and declined gradually until 1987, partly because of strong European and Canadian competition. The U.S. share of world pork exports is expected to be approximately 2.8 percent in 1990, about two-thirds as large as the record 1976 trade share. While some growth in U.S. pork exports is possible in future years if the U.S. dollar remains near recent levels in foreign currency markets, U.S. producers continue to face import barriers in other countries and strong competition from other pork exporting nations.

Figure 24. Percentage Shares of World Beef and Veal Exports by Major Exporters, 1975-90 Calendar Years.[a]



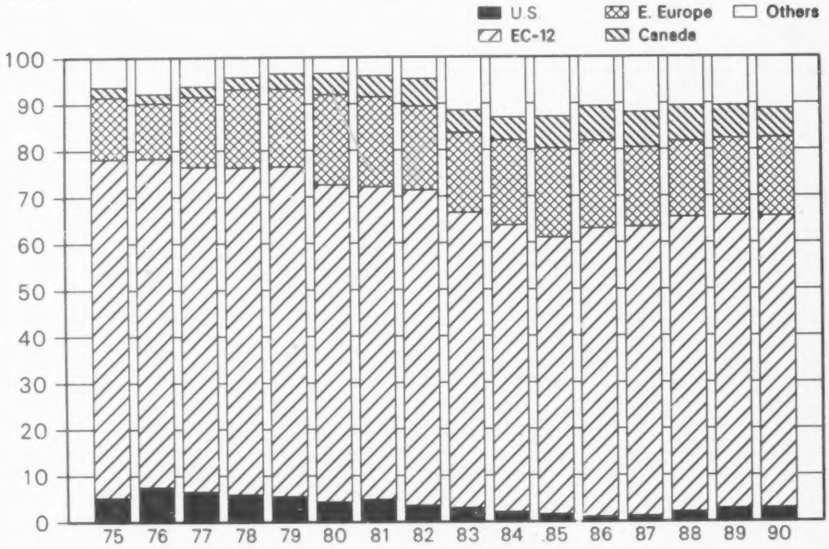
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 1-87, September 1987; FL&P 2-88, October 1988; FL&P 2-90, March 1990; various other issues; *Foreign Agriculture Circular: Livestock and Meat*, FLM 2-81, February 1981; various other issues.

[a] Includes intra-EC trade. From 1983 on, the EC is EC-12.

Poultry Meat Export Shares

As shown in Table 14, the U.S. share of world poultry meat exports rebounded in the late 1980s after a downward trend from 1981 through 1985. Poultry meat exports from the U.S. in 1989 accounted for approximately 23 percent of the world total, up from 20 percent in 1980. The U.S. poultry meat export share is expected to remain approximately constant in 1990, with competition from the EC and Brazil remaining strong, and with growing competition from Thailand. Since 1985, global exports have trended modestly upward. Impediments to U.S. poultry meat exports from an overvalued dollar have diminished substantially since the mid-1980s and helped the U.S. expand its market share. At the same time, debt pressures and high real interest costs encouraged Brazil and Eastern Europe to place greater emphasis on value-added exports, including poultry and poultry products, as a means of earning foreign exchange. Also, a shift in dietary patterns from red meat to poultry meat in the U.S. temporarily reduced the availability of poultry meat for export. However, in 1987, 1988, and 1989, U.S. poultry production expanded sharply enough to supply strong growth in both domestic and export markets. The shift in U.S. dietary patterns reflects consumer concern over cholesterol in red meat as a contributor to heart disease and acceptance of an increased variety of convenience-type poultry products that can be prepared quickly for consumption. These same forces likely will continue to influence patterns of world trade in poultry meat.

Figure 25. Percentage Shares of World Pork Exports by Major Exporters, Calendar Years 1975-90.[a]



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 1-87, September 1987; FL&P 2-88, October 1988; FL&P 2-90, March 1990; various other issues; *Foreign Agriculture Circular: Livestock and Meat*, FLM 2-81, February 1981; various other issues.

[a] Includes intra-EC trade.

Table 14. World Poultry Meat Exports by Selected Exporters, 1974-78 Average, 1979, 1981, 1985, and 1987 through 1990 in Thousands of Metric Tons.

Area	1974-78 Average	1979	1981	1985	1987	1988	Prelim. 1989	Proj. 1990
U.S.	148	228	375	211	363	382	454	466
Brazil	23	81	295	274	216	240	233	243
EC-12[a]	N.A.	271	465	346	384	411	426	435
E. Europe	173	196	289	303	398	447	423	389
Others	33	42	46	100	144	175	184	196
Total[a]	N.A.	818	1,470	1,234	1,505	1,655	1,720	1,729
Total[b]	853	1,156	1,836	1,663	2,009	2,232	2,351	2,406

Sources: U.S. Department of Agriculture, *Foreign Agricultural Service, Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; *Foreign Agriculture Circular: Dairy, Livestock and Poultry Situation*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-87, September 1987; FL&P 1-88, September 1988; and FL&P 1-90, January 1990.

[a] Excludes Intra-EC trade.

[b] Includes Intra-EC trade.

Dramatic East European Political Changes and World Agricultural Trade

In 1989, the six East European nations of Poland, East Germany, Hungary, Romania, Bulgaria, and Czechoslovakia abandoned dictatorships to adopt democratic forms of government and made firm commitments to restructure their economic systems as market economies. Because these countries are important grain and livestock producers, changes in their political and economic systems could have important impacts on world agricultural trade in major farm products. Market economies are likely to encourage increased agricultural production over the longer term, but also may bring expanded domestic demand for livestock and poultry products due to rising consumer incomes. However, the time required for expanded production and demand remains uncertain.

These nations, together with Yugoslavia, have a total population 42 percent as large as the European Community (EC) and an arable land area about three-fourths as large as EC. Thus, human and land resources together suggest that with an economic system leading to western standards of agricultural productivity, the area could become a significantly larger competitor in world markets than the EC. This observation is reinforced by several facts, including: (1) average wheat, coarse grain, and oilseed yields for the area were 12 to 20 percent below those of the EC from 1983 to 1987; (2) the area was a net grain exporter prior to World War II; (3) four of the seven countries have been small net exporters at times in recent years; (4) its per capita coarse grain use is approximately double that of EC, indicating major inefficiencies in its livestock and poultry feeding industry, and (5) its per capita wheat utilization is about 60 percent greater than in EC.

Tables 15 and 16 show general characteristics of the Eastern European population, land base, and agriculture, and comparisons with the EC. Eastern Europe's population of 136.3 million in 1988[16] (139.4 million if Albania is included), is much smaller than the 324.8 million of the European Community, and is more agriculturally oriented. As a whole, about 18 percent of the total economically active population is employed in agriculture, with a low of 9 percent in East Germany and highs of 22 percent in Romania, 24 percent in Yugoslavia, and 50 percent in Albania. In the EC, 6.4 percent of the total economically active population is reported to be employed in agriculture, with the highest agricultural employment being 25.5 percent in Greece. The largest concentrations of arable land in Eastern Europe are in Poland (15 million hectares), Romania (10 million hectares), and Yugoslavia (7 million hectares). Total arable land for the East European region is 45.6 million hectares (114.1 million acres) approximately four times as large as in the state of Iowa in the U.S., the nation's leading coarse grain producing state. From another perspective, its arable land area is roughly comparable in size to that of the top seven U.S. corn producing states.

Table 15. Comparison of Economic Conditions Between East European and EC Countries (in 1,000 Hectares and 1,000 People).

					Population Active in Agriculture Production			
					1975		1988	
	Arable Land		Total Population					
Country	1972	1987	1975	1988	Amount	Percent of Total Economically Active Population	Amount	Percent of Total Economically Active Population
Albania	624	714	2,424	3,134	637	61.0	739	49.8
Bulgaria	4,510	4,131	8,721	8,982	1,192	26.5	592	13.2
Czechoslovakia	5,323	5,134	14,802	15,612	1,162	15.1	823	10.0
East Germany	4,843	4,934	16,850	16,658	1,011	11.6	815	8.6
Hungary	5,565	5,289	10,532	10,597	1,178	21.7	662	12.7
Poland	15,147	14,739	34,022	37,860	6,111	33.7	4,249	22.2
Romania	10,488	10,686	21,245	23,020	4,400	39.6	2,554	22.1
Yugoslavia	8,130	7,766	21,365	23,549	3,954	41.0	2,513	23.6
Total E. Europe	46,500	45,627	129,961	139,412	19,645	29.6	12,947	18.4

Source: *Food and Agriculture Organization of the United Nations. Production Yearbook.* (Rome, Italy) 1988, No. 42.

Table 16. Comparison of Agricultural Production Between East European and EC Countries (Area in 1,000 Hectares, Yield in Killograms/Hectares, and Pork in 1,000 Metric Tons).

	Wheat				Coarse Grain				Pork Production	
	1979-81		1988		1979-81		1988		1979-81	1988
Country	Area	Yield	Area	Yield	Area	Yield	Area	Yield		
Albania	196	2,514	191	3,080	167	2,462	156	2,729	9	9
Bulgaria	896	3,927	1,181	3,991	1,108	3,760	920	3,352	315	381
Czechoslovakia	1,121	3.982	1,239	5,283	1,450	3,647	1,230	4,322	823	914
East Germany	698	4,373	765	4,831	1,802	3,363	1,639	3,733	1,211	1,400
Hungary	1,187	4,014	1,281	5,435	1,675	4,881	1,544	4,936	899	985
Poland	1,525	2.755	2,179	3,480	6,350	2,247	6,260	2,703	1,617	1,748
Romania	2,154	2,533	2,500	3,600	4,249	3,367	3,984	5,507	970	850
Yugoslavia	1,475	3,133	1,506	4,185	2,826	3,841	2,674	3,638	802.	850
Total E. Europe	9,342	3,310	10,842	4,187	19,627	3,237	18,407	3,866	6,646	7,137

Source: *Food and Agriculture Organization of the United Nations Production Yearbook.* (Rome, Italy) 1988, No. 42.

Short vs. Long-Term Supply-Demand Prospects[17]

For the next one to three years, Eastern Europe may be a modestly expanding net importer of western agricultural products. The economies and people of the region are experiencing substantial stress from inflation, unemployment, limited food supplies, and the learning process involved in shifting to democratic political institutions, and a market-directed economy. These stresses are likely to continue to some degree for a minimum of three years and possibly longer. The U.S. and Western Europe have a strong stake in helping Eastern Europe through these initial stresses and in making the transition to a market-directed economy. Likely assistance will cover a broad range of areas including technical information and training, capital investment, credit, joint ventures with private firms, and assistance in developing capital and agricultural product markets.

In the food and agricultural area, Western assistance likely will include enough export shipments of wheat, coarse grains, and protein meal in the next one to three years to encourage expanded East European livestock and poultry production and adequate consumer supplies of cereal products without seriously reducing the incentive for East European grain and oilseed farmers to expand output. Modest quantities of livestock and poultry exports to Eastern Europe also are possible in the short run to encourage political stability. In addition, substantial assistance is expected in the form of increased availability of fertilizer, other agricultural chemicals, animal health products, technical information related to crop and livestock production, and training in risk-management, financial management, and other managerial skills needed to operate in a market economy. For the short run (one to three years), Eastern Europe may represent a modest growth market for U.S. and West European farm products, although agricultural exports to the area likely will have to be government assisted, through donations, subsidies, or liberal credit terms. Another temporarily positive benefit for Western agriculture may be the reduced flow of grain from Eastern Europe to USSR as East European governments increase the priority given to food supplies for their own people. The net result may be slightly larger Soviet grain import potential from non-East European countries than in past years of similar USSR grain production.

Longer-term implications of recent East European political and economic changes for world agricultural trade are less clear and will depend heavily on the rate of improvement in productivity of its agriculture. After decades of operation under a government-directed system, considerable time will be required to develop entrepreneurial skills, marketing and financing institutions, and needed improvements in infrastructure. A minimum of five to eight years may be needed to bring these areas up to their full potential. The population and resource base of the region suggests that ultimately it may become a sizable exporter of grains, and pork, and poultry products on a continuing basis, and a relatively large net importer of oilseeds and protein meal.

East European changes may pose some special challenges for the EC agricultural economy over the longer term, due to the region's close proximity, transportation linkages, location advantages over EC in serving Soviet and certain other foreign markets, and the reunification of Germany. The first of these challenges is likely to occur during the 1990-1992 time frame with the reunification of Germany and the entrance of East Germany into the Common Agricultural Policy. Introduction of EC agricultural policies in East Germany is likely to assist the adjustment of the country's agriculture to a market economy and to allow it to make the transition more rapidly than most other East European nations, with the possible exception of Poland.

European Community Unification in 1992[18]

By late 1992, the European Community (EC) is scheduled to implement a series of policy changes intended to create a unified, or single, market for agricultural and industrial products within the community. The unification is intended to permit unhindered movement of resources, products, services, and workers within the EC, ultimately increasing its competitiveness in world markets. These EC policy changes have the potential to impact trade patterns of other nations to some extent. At this writing, a number of issues remain to be resolved before unification will be possible. A critical issue for both the agricultural and nonagricultural sectors is the development of a unified monetary system. Efforts to develop such a system will be complicated by nationalism and national histories reflected in the currencies of individual countries. For agriculture, unification also will focus on four other important areas. These are: (1) harmonizing taxes on food, farm products, and inputs; (2) eliminating border taxes and subsidies; (3) eliminating national quotas and conflicting national assistance programs; and (4) harmonizing or unifying health standards, food labeling, and ingredient and packaging laws.

Unification of Agriculturally Related Taxes and Subsidies

One of the main taxes applied to food in the EC is a value-added tax (VAT), which varies from country to country. This tax ranges from a low of 0 to a high of 38 percent on some luxury items in some countries. Value-added taxes will need to be made uniform from country to country within the EC. Harmonizing of the VAT will create political and fiscal stresses in some countries, due to rising food costs and/or reduced national government revenues.

The EC also has indirect border taxes and subsidies to member nations that are applied through currency adjustments. For agricultural support purposes, the EC uses an aggregation of currencies called European Currency Units (ECUs) to express the community-wide government support prices. This system originated in August 1969[19]. Individual countries have a "green exchange rate," or "green parity rate," which is used to convert ECUs to support levels in the country's currency. The rates are adjusted periodically to compensate for differing rates of inflation among member nations. These exchange rates also vary from one type of agricultural product to another. In interim periods, if a country's currency changes significantly in value relative to currencies of other nations, a "monetary compensatory amount" (MCA) is used to adjust that country's "green exchange rate" and internal support prices[20]. This system is further complicated by a "currency factor" that is adjusted daily to reflect changes in the value of the U.S. dollar relative to EC currencies. For agriculture, the main impact of the currency factor is on the size of levies applied to imports into the Community and EC export subsidies, rather than on intra-EC trade.

EC unification plans call for removal of the MCAs. This step may cause serious political stress since it will affect prices of farm products and food in local currencies and will no longer protect farmers and consumers from fluctuations in exchange rates of individual EC currencies. The exchange-rate fluctuations often are due to differential inflation rates among member nations, so elimination of the MCAs may work to the disadvantage of farmers in member countries with high inflation rates and to the advantage of those in countries with low inflation.

Related policy areas to be dealt with include numerous agricultural assistance programs in individual countries such as tax rebates, tax incentives, and national subsidies. These programs alter the economic position of agriculture in one nation relative to others and thus are inconsistent with the concept of a unified market.

Quotas and Third Country Agreements

Some EC member nations have individual import quotas or quotas granted to specific non-EC countries for agricultural products. These quotas clearly violate the spirit of a unified EC market by limiting the ability of other EC producers or processors to compete in the market for the product or products in question in the country involved. Thus, such quotas eventually will need to be eliminated, although there are no current proposals for doing so.

Unification of Health Standards, Food Standards, and Regulations

This is the area scheduled for the greatest activity in the unification process, with 70 of slightly more than 100 unification directives relating to plant and animal health and food labeling. These changes should somewhat simplify exports of high-value agricultural products to the EC by the U.S. and other nations, because exports will need to meet only one set of regulations. However, the changes will be controversial and an agreement on the changes will be difficult to reach. Currently there are more than 200 nontariff barriers to intra-EC trade in the food sector, encompassing areas such as labeling, packaging, and ingredient composition. Standardizing these regulations will involve highly technical details as well as confronting protectionist pressures in individual countries.

General Observations and Implications for U.S. and Other Agricultural Exporters

The EC has much remaining work and a number of politically sensitive areas to deal with before its goal of a unified market is attained. Given the complexity of agricultural issues alone, the late 1992 target for full unification may be an optimistic one. Attainment of the late 1992 goal also will be complicated by the German reunification process. Nevertheless, substantial progress toward a unified EC market should be expected in the next two years. The unification should contribute to a more economically efficient EC agricultural sector, with production of various products tending to be concentrated increasingly in areas with the greatest comparative advantage. Consequently, unification may make the EC a slightly stronger competitor in world markets and/or slightly reduce its potential as an agricultural import market.

At the same time, when full unification is attained, U.S. and other exporters should find the job of marketing high-value agricultural products in the EC to be somewhat simplified. Instead of producing products to meet the multitude of standards involved in exporting to 12 individual nations, only one set of standards will need to be met to supply the EC market. In a number of cases, those standards are likely to continue to be quite stringent. Thus, a unified EC in 1992 does not necessarily guarantee a rapidly expanding market for high-value U.S. farm products in Western Europe.

Soviet Food Import Situation Becomes More Complex

The Soviet Union in recent years has been the world's largest and most variable importer of grains, and a significant importer of oilseeds and oilseed products. Its average annual imports of wheat and coarse grains has been 32.6 million metric tons, compared with a five-year average of 27.3 million tons for Japan, the world's number two grain importer. During the past five years, Soviet grain imports have fluctuated in an 11.2 million ton range, considerably less than in the previous five years but far greater than Japan's 1.4 million ton range. Soviet grain imports have been large for nearly two decades, despite the fact that it has by far the largest amount of arable land of any nation (21 percent more than the U.S. and 229 percent more than EC), it is one of the world's largest grain producers, and its total population is much smaller than that of China and India, and significantly smaller than the EC.

Large and highly variable Soviet grain imports raise important questions about the future of world grain and oilseed trade. In the past five years, the Soviet Union, under the leadership of President Mikhail Gorbachev, has initiated major agricultural reforms intended to increase the productivity of its crop sector; reduce handling, drying, and storage losses; and increase feed conversion efficiency in its livestock and poultry sectors. Performance in all these areas falls far short of Western standards. Along with agricultural reforms, unrest of its citizens and internal and external political developments may impact its importing patterns in the years immediately ahead. Availability of plentiful food supplies appears to be a vitally important requirement in maintaining internal political stability. At the same time, large grain imports have been a drain on foreign exchange supplies that otherwise would have been available for importing products to improve the performance of other economic sectors. The picture for the years immediately ahead is further complicated by strong independence movements in several Soviet republics, including Lithuania, Latvia, Estonia, the Ukraine, Georgia, Armenia, and Azerbaijan. U.S. political decision makers appear to be sensitive to Soviet handling of these internal political situations, and as a result they could affect availability of Most-Favored National Status, U.S. government-guaranteed credit, and export-assisted commodity sales to the Soviet Union.

With large year-to-year fluctuations in its grain production and imports, the Soviet Union is a major influence on the volume of grain traded in world markets and has considerable impact on world grain prices. The extremes in year-to-year changes in its grain production since the early 1970s have ranged from slightly over an 80 million metric ton (three billion bushel) increase to nearly a 60 million metric ton (2.3 billion bushel) decrease. As an example of the potentially volatile Soviet role in world markets, approximately one-fourth of the world grain trade and one-third of all U.S. corn exports in 1984-85 were accounted for by Soviet imports. But the next year, its imports accounted for only 17 percent of global grain trade and about one-fifth of all U.S. corn exports. The Soviet Union's significance as a price-influencing factor is caused both by the size and variability of its imports and by its centralized grain purchasing system. Grain import decisions in the USSR have been made by a small group of government officials who can contract for the nation's entire yearly grain import needs in a very short time if they wish to do so. This centralized purchasing system created the potential for an ever-present element of surprise in Soviet buying patterns.

The USSR's initial entry into world grain markets in the early 1970s as a large and continuous grain importer was an example of this surprise element, with Soviet buyers dealing with several large grain firms and failing to disclose the total size of their import needs to any one firm or to U.S. Department of Agriculture officials in charge of the wheat export subsidy program. Since that time, grain merchandisers throughout the world have monitored Soviet weather, political developments, freight bookings,

Table 17. Soviet Grain, Soybean, and Soybean Meal Importing Patterns in Millions of Metric Tons, Selected Years 1975-76 through 1989-90.

	1975-76	1976-77	1977-78	1983-84	1984-85	1986-87	1987-88	1988-89	Prelim. 1989-90
Wheat Imports[a]	10.1	4.6	6.6	20.5	28.1	16.0	21.5	15.5	14.0
Coarse Grain Imports[a]	15.6	5.7	11.7	11.5	27.3	10.8	10.6	22.5	23.5
Total Imports, Wheat and Coarse Grains	25.7	10.3	18.3	32.0	55.4	26.8	32.1	38.0	37.5
Percentage from U.S. Origin[b]	54%	72%	78%	44%	28%	15%	42%	58%	54%
Soybean Imports	1.7	1.5	0.9	1.0	0.9	1.5	1.4	0.7	0.8
Percentage from U.S. Origin[b]	18%	62%	93%	50%	0%	5%	58%	43%	43%
Soybean Meal Imports	0.0	0.1	0.0	0.8	0.6	2.9	3.0	4.0	4.3
Percentage from U.S. Origin[b]	0%	100%	0%	0%	0%	0%	44%	34%	32%

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 23-82, July 16, 1982; FG 10-83, April 12, 1983; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-87, April 1987; FG 7-87, July 1987; FG 3-88, March 1988; FG 8-89, August 1989; FG 3-90, March 1990; *Foreign Agriculture Circular: World Oilseed Situation and Highlights*, FOP 4-87, April 1987; FOP 4-88; April 1988; FOP 8-89, August 1989; FOP 6-90, June 1990; U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the Unites States*, November-December 1987; November-December 1988; *Foreign Agriculture Circular: Oilseeds and Products*, FOP 4-81, March 1981; FOP 9-82, July 1982; FOP 4-83, April 1983; FOP 6-84, June 1984; U.S. Department of Agriculture, Agricultural Marketing Service (Independence, Mo.) *Grain and Feed Market News*, various issues; U.S. Department of Agriculture, Foreign Agriculture Service, *U.S. Export Sales*, June 1982, various issues and personal communication with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

[a] July-June trade years.

[b] Imports from U.S. origin are on October-September marketing years.

and other factors that might reveal purchasing patterns. The importance of this potential surprise element stands out when the USSR purchasing system is contrasted with that of Japan, another large grain importer. Japan's private enterprise system spreads purchasing decisions over a large number of individual decision makers. As a result, the element of potential surprise in Japanese grain buying is almost nonexistent, except for the timing of purchases within the year. Absence of the surprise element comes from the fact that Japan's grain import levels are relatively stable from year to year. Consequently, little or no world grain price reaction usually follows Japanese purchase announcements. Appendix VIII provides more background on the Soviet Economy and comparisons between the U.S. and the USSR.

1989-90 Soviet Coarse Grain Imports Stabilize Well Below Record

With more favorable weather, Soviet grain production increased modestly in 1989, but record or near-record livestock and poultry production and low grain carryover stocks held its grain imports near the 1988-89 level at 38.5 million metric tons (July-June trade year), up six million metric tons, or 19 percent, from two years earlier. Previous records in Soviet grain imports were 55 million metric tons in 1984-85, and 46 million tons in 1981-82. Soviet coarse grain production in 1988 fell 14 percent or 16 million metric tons below production a year earlier due to drought and greater than normal unharvested area. Its 1988 wheat production, however, was about 1 percent above a production year earlier. With USSR wheat quality being much higher than in the previous season, its wheat imports dropped 30 percent or 6.5 million metric tons below imports a year earlier. In 1989, its total grain production rose an estimated 16 million metric tons or 8 percent above the previous year, to a total of 211 million metric tons. According to early indications, total Soviet grain production in 1990-91 may be up modestly from a year earlier. Its winter wheat crop, which normally accounts for approximately one-third of the country's total grain harvest, reportedly was in good condition in late spring 1990 and prospects for spring-planted crops looked average or better.

Longer-Term Grain Production Prospects

Figure 26 shows a large year-to-year variability and little upward trend in Soviet grain yields since the early 1970s. Future trends in Soviet grain imports will depend heavily on its success in reducing annual yield variability and in overcoming long-standing difficulties in improving the productivity of its grain sector. Factors contributing to these two problems are complex and include climatic limitations from a grain belt that lies largely on a latitude similar to that of the Canadian prairie provinces. Its climate includes a short growing season, substantial risk of frost and drought damage, and periodic problems from excessive rain or snow during the harvesting and winter wheat planting seasons.

Along with climatic limitations, Soviet agriculture faces serious coordination problems from its state-controlled agricultural system. These problems are evident from reports of a chronic lack of spare parts and disabled machinery during key fieldwork periods; inadequate crop drying, storage, and transportation equipment at harvest; harvesting and planting delays as farm workers wait for instructions on the individual day's activities; lack of the proper type and quantities of fertilizer at the time it is needed; and similar problems with other inputs. With the USSR's short growing season, optimum timing and coordination of all operations is essential for an efficient crop production sector.

While substantial time is likely to be required to achieve improved coordination in the Soviet crop sector, the nation is shifting in that direction. The Soviet presidency is now held by Mikhail Gorbachev, a relatively young man trained in agronomy and experienced in USSR agriculture. Massive Soviet grain and oilseed imports have absorbed foreign exchange that otherwise could have been used to improve industrial output, so a strong incentive exists for the USSR to deal with lagging productivity in crop production. According to a U.S. Department of Agriculture publication, the Soviet administration is attempting to streamline and optimize the current agricultural system, rather than make radical changes. In the streamlining process, a move is under way to improve labor productivity through a contract system where worker remuneration is linked more closely with output.[21] The nation also is experimenting with long-term leases of farmland to farm families and a pilot program of selling shares in state farms to farm workers, with return on the shares dependent on the economic performance of the farm.[22] The Soviet Union also is emphasizing an Intensive Technology Program involving use of improved varieties and increased use of fertilizers, herbicides, and other inputs. About one-third of its grain area was in the Intensive Technology Program in 1987, up from 16 percent two years earlier, according to an International Wheat Council report.[23] That report also stresses a need for increased Soviet grain drying, storage, and handling capacity to cut the excessively high post-harvest losses to benefit from the Intensive Technology production gains.[24]

Other Soviet policies aimed at improving crop production include plans for large investments in a long-term program to drain approximately 20 million hectares of potential cropland by the year 2,000 and to extend irrigation to an additional 30 to 32 million hectares.[25] Available investment funds and costs of the projects will determine whether these goals are attained. Investment plans also call for expanded grain storage and handling facilities to reduce spoilage losses, and increased production of fertilizer and farm machinery.[26] Soviet grain and oilseed yields are likely to trend upward in the years ahead. However, the performance of the last 15 years suggests that changes probably will be gradual, and that the USSR will likely continue its large and variable pattern of grain imports for the next several years.

Oilseed Prospects

Prospects for Soviet oilseed and/or oilseed product imports are less clear than those for grain. Official plans call for sharply increased oilseed production, but so far, little progress has been made in that direction (see Table 18). Despite increased protein meal imports, Soviet livestock rations are extremely low in protein by Western standards. Sharp increases in protein meal imports could enable Soviet agriculture to more efficiently use limited grain supplies and also could improve productivity of its livestock and poultry sectors. For these reasons, the current Soviet leadership appears to be placing increased priority on large oilseed and/or protein meal imports for the years ahead. This shift in priority began in mid-1987 with sizable purchases of South American soybeans and meal and was followed by unusually large purchases of U.S. soybeans and soybean meal in late 1987, 1988, and the 1989-90 marketing year. In the early 1980s, the Soviets experimented with increased protein meal imports for one year, but allowed imports in following years to decline to previous levels.[27] However, imports in the past three marketing years and greater knowledge of how to transport, process, and use soybean meal in livestock and poultry feeding now may be positioning the Soviet Union for further increases in its soybean meal and/or soybean imports in the years ahead.

Table 18. Soviet Oilseed Production in Millions of Metric Tons, 1972-73 through 1989-90.

	Soy-beans	Cotton-seed	Sun-flower
Preliminary			
1989-90	.92	4.85	7.00
1988-89	.88	4.87	6.16
1987-88	.71	4.64	5.24
1986-87	.70	4.87	5.26
1985-86	.46	4.94	5.23
1984-85	.47	4.74	4.53
1983-84	.56	4.82	5.06
1982-83	.50	5.09	5.34
1981-82	.45	5.28	4.65
1980-81	.53	5.08	4.62
1979-80	.40	4.14	5.41
1978-79	.63	4.67	5.33
1977-78	.54	4.69	5.90
1976-77	.48	4.51	5.28
1975-76	.78	4.81	4.99
1974-75	.36	4.53	6.78
1973-74	.42	4.36	7.39
1972-73	.26	4.09	5.05

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 4-88, April 1988; FOP 3-90, March 1990; *Foreign Agriculture Circular: Oilseeds and Products*,FOP 4-84, April 1984; FOP 2-84, February 1984; FOP 11-83, November 1983; FOP 9-83, September 1983; FOP 13-82, November 1982; *Foreign Agriculture Circular: World Crop Production*, WCP 4-85, April 1985; WCP 5-86, May 12, 1986; WCP 7-87, July 1987; WCP 12-87, December 1987; *Foreign Agriculture Circular: World Agricultural Production*, WAP 2-89, February 1989; WAP 3-90, March 1990.

Livestock Sector

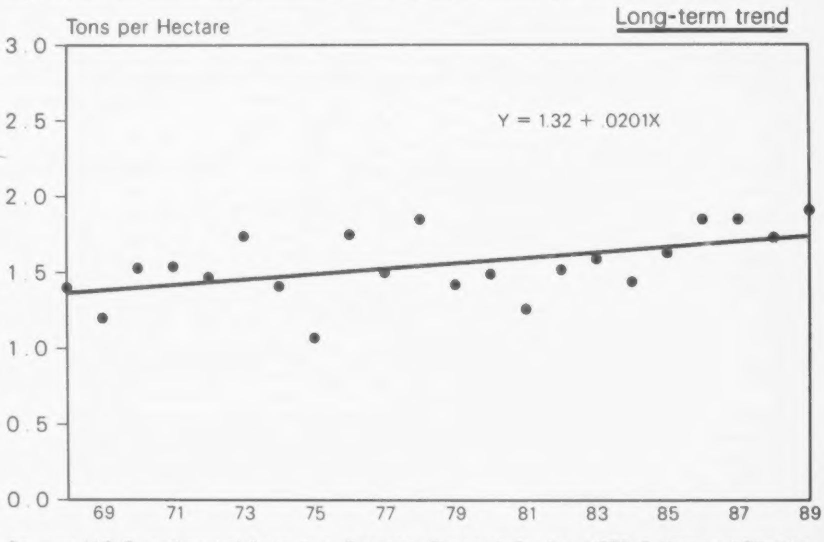
In the USSR livestock sector, aggregate livestock numbers have expanded slowly since 1985, with preliminary estimates of 1989 total beef, pork, and poultry meat production reaching a record 20 million metric tons, 1.6 percent above levels a year earlier.[28] Milk production expanded by 1.2 percent, while egg production fell by an estimated 0.6 percent.[29] Similar changes in agricultural production are expected in 1990. Use of grain in livestock and poultry feed in the USSR has fluctuated in a relatively narrow range in recent years, despite increased meat, egg, and milk production.[30] Thus, feed conversion efficiency of the Soviet livestock sector appears to be improving. Further increases in feed conversion efficiency appear likely in the years ahead through animal breeding and genetics, improved animal health and nutrition, better management, and increased protein content in rations.

U.S.-USSR Grain Agreement

The current U.S.-USSR Grain Trade Agreement went into effect in October 1988 and is scheduled to expire in December 1990. It requires the United States to make available, and the USSR to purchase, a combined minimum of 9 million metric tons annually of U.S. corn and wheat, divided about equally between corn and wheat. The agreement allows soybeans or soybean meal to be substituted for grain at the rate of 0.5 million metric tons of soybeans or soybean meal for each 1 million tons of grain, at the discretion of the USSR, in meeting the minimum purchase commitment. In addition, the agreement permits the USSR to purchase a combined maximum of up to 12 million tons of U.S. wheat and corn without prior consultation with the U.S. government. With consultation, additional purchases beyond the 12 million ton limit were permitted. In recent trade years, the U.S. administration often has increased the maximum quantity in the agreement. For example, in 1984-85 when Soviet grain exports reached a record high, it offered to make as much as 27 million tons of U.S. corn and wheat available to the USSR, and in 1989-90 it gave approval for the Soviet Union to buy up to 22 million tons of U.S. grain. Actual Soviet purchases of U.S. grain in 1984-85 were only about two-thirds the maximum permitted amount. Since that time, Soviet purchases have consistently remained below the maximum permitted level and frequently have been below the maximum specified in the agreement. The U.S. administration in 1987-88 gave approval to the Soviet Union to buy whatever quantity of U.S. grain it wanted. In 1988-89, the maximum purchase level was raised to 26 million metric tons, despite the most severe U.S. drought in over half a century. At this writing, a new five-year U.S.-USSR grain agreement has just been negotiated and signed. The agreement, scheduled to go into effect as the current one expires, is similar to earlier versions except that the maximum quantity of annual grain purchases has been increased by 2 million metric tons. Also, the corn portion of the agreement has been broadened so that barley and grain sorghum may substitute for a portion of the required corn purchases.

A long-term agreement has been part of the U.S. trade policy with the USSR since the mid-1970s. It was originally an effort to bring greater stability and predictability to Soviet purchasing patterns. Through most of the period in which the agreements have been in effect, both sides have honored their minimum commitments for corn and

Figure 26. Trend in USSR Grain Yields in Metric Tons per Hectare, 1968-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *USSR Outlook and Situation Report*, RS 87-4, May 1987; RS 88-2, May 1988; Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; FG 7-85, May 1985; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-87, April 1987; FG 3-88, March 1988; FG 4-90, April 1990; Statistical Reporting Service, *USSR Grain Statistics, National and Regional 1955-1975*, Statistical Bulletin No. 564.

wheat. However, in 1984-85 and 1985-86, the USSR temporarily failed to meet its minimum annual U.S. wheat purchase obligations. As their explanation for doing so, Soviet officials said U.S. wheat was priced above wheat of other exporters and that the U.S. had refused to grant the USSR adequate price concessions through its Export Payment-in-Kind (or Export Enhancement) program. Since then, large offers of Export Enhancement Program (EEP) wheat have been extended to the Soviet Union and have resulted in Soviet purchases of U.S. wheat equal to or exceeding minimum levels specified in the agreement. The new agreement specifies that the U.S. is required to provide competitive wheat prices to USSR as a part of its obligations.

Despite previous problems with wheat sales to the Soviets, the USSR is likely to continue as a large importer of U.S. corn in the next few years. Alternative non-U.S. supplies of corn in quantities typically imported by the USSR are much more limited than those for wheat. However, total Soviet purchases of U.S. grain probably will continue to vary substantially from year to year, depending on the size of the Soviet grain harvest, the availability of foreign exchange, and political relationships between the two nations. Its future wheat import levels appear more uncertain than those for corn.

Other New U.S.-USSR Agreements

In addition to the new five-year U.S.-USSR grain agreement, the two nations in mid-1990 signed maritime, food processing, and trade agreements that are designed to facilitate the flow of goods, services, and capital between the two trading partners. The trade agreement must first be approved by the U.S. Congress before it can be implemented. Congressional approval at midyear appeared to depend on the Soviet's enactment of legislation liberalizing its emigration policies and softening its stand on independence of the three Baltic republics. If approved by Congress, the trade agreement would pave the way for granting of Most-Favored-Nation status to the Soviet Union, including lowering of U.S. import duties on Soviet products and possible access to short-term U.S. government loan guarantees for purchasing U.S. farm products. These and other benefits would be important to the USSR in increasing its access to world capital markets and in earning additional foreign exchange to pay for imports. In 1989-90, a tightening foreign exchange position and restructuring of its import purchasing processes caused the Soviets to purchase grain on credit, for the first time in years. Its changing economic situation also led to substantial payment delays, which in some cases made Western firms reluctant to do business with the Soviets.

The U.S.-USSR maritime agreement allows each country the freedom to ship products purchased from the other by using vessels obtained through competitive freight rate bidding.[31] Previously, the usually higher cost U.S. vessels were required to have at least a one-third share of all shipments to USSR. The agreement reduces advance Soviet notification time for intent to enter ports from a previous two weeks to the current two days.

The two nations also entered into an agreement that provides a framework to facilitate and encourage U.S. firms to invest in the Soviet food processing sector. The agreement does not include U.S. government financial support for such investments, but establishes a legal basis for investing in the Soviet food sector. However, serious obstacles must be overcome before large scale U.S. investments in USSR can be expected. Among them are financing and means by which profits from investments in USSR can be withdrawn from the country. Since the Soviet currency, the ruble, is not convertible in foreign currency markets, the main method of withdrawing profits currently would be in the form of Soviet goods. Except for energy, minerals, fertilizer, and gold, most Soviet goods are not in strong demand in world markets. These problems may eventually be overcome as the USSR develops a market-oriented monetary system including eventual convertibility of its currency, and as expanding trade and Soviet economic restructuring lead to the production of a greater variety of Soviet goods.

Soviet Actions to Develop a Market Economy

In June 1990, the Supreme Soviet (the nation's legislative body) passed a series of laws intended to accelerate the transition to a regulated market economy, and the development of a market oriented monetary system. Preliminary reports indecate directives have been given to sell off 40 percent of all Soviet state property within two years and 60 percent within three years. Types of property to be "denationalized" include factories, stores, farms, and housing facilities. In addition, action is to be taken to create a stock market and a new banking system, and to reduce the Soviet government budget deficit. Considerable effort on the part of Soviet leaders and officials will be required to implement such vast changes. Restructuring of the economy is certain to be accompanied initially by increased inflation, unemployment, and resistance from workers and established officials who would be likely to lose their positions. The time requirement for full implementation remains uncertain and will depend on the speed with which Soviet citizens are able to develop the skills necessary to function in a market economy. Ultimately, such changes should lead to increased trade between the Soviet Union, the U.S. and other nations, due in part to rising Soviet incomes.

Financial Developments Affecting U.S. and World Agricultural Trade[32]

After the longest peace-time economic expansion in the nation's history, the U.S. economy is expected to experience a slightly diminished rate of growth through 1990 and 1991. Some private forecasts also show some probability of at least a brief recession in the U.S., beginning sometime in the next year or two, due in part to continued large (but gradually shrinking) U.S. trade and budget deficits and the unusually long period over which the current expansion has occurred. Because the U.S. led the world economy out of the recession of the early 1980s, slower U.S. economic growth is expected to be a tempering influence on the world economy for the next 6 to 20 months or more. Growth rates will differ substantially from one country to another. Moderate economic growth is expected in Pacific Rim nations including the Republic of Korea, Japan, Taiwan, Hong Kong, Singapore, and Malaysia. Economies of these countries are expected to be supported by strong exports to the U.S. However, economic growth in the Pacific Rim may be tempered by a slowing U.S. economy, U.S. trade legislation, and pressure to open economies of these countries to increased U.S. imports. Recent trends suggest West European economies may experience some acceleration in economic activity during the next 12 to 24 months, due to increased investment and marketing opportunities in Eastern Europe. However, continued slow economic growth is likely in several heavily indebted developing nations including Egypt, Brazil, Argentina, Nigeria, and a number of other countries in Latin America and Africa. In addition, economic growth in USSR and China appears likely to be below the average of recent years. In general, these trends point to a possible slight moderation in the growth rate of U.S and world export demand for agricultural products for the next one to two years if weather conditions are favorable in major foreign crop-producing regions.

Key Problem Areas

Global economic prospects for the years immediately ahead are closely related to three problem areas: (1) continued heavy indebtedness of developing nations, the U.S. government, and many private firms and individuals in developed economies, accompanied by large financial needs for debt servicing; (2) fluctuations in the exchange rate of the U.S. dollar, the Japanese yen, and West German mark; and (3) the level of real interest rates (nominal interest rate minus inflation rate), which affect debt-servicing costs, economic growth, the availability of consumer funds for food purchases, and agricultural production, processing, storage, and marketing costs.[33]

These three problem areas are closely interrelated and stem, at least partly, from U.S. monetary and fiscal policies. The U.S. fiscal policy with several years of record federal budget deficits is highly stimulative to the U.S. economy. To offset this and restrain inflationary pressures, a restrictive U.S. monetary policy has been required. These diverging policies have created a strong U.S. government demand for credit, with resulting high domestic real interest rates, even though U.S. real interest rates declined sharply from record levels of the early 1980s.

Since international investment capital moves freely and quickly from one country to another in search of maximum returns, capital movement into the U.S. has been heavy. The strong foreign demand for U.S. dollars for investment purposes has been a supporting influence on the U.S. currency, with its value against major Pacific Rim currencies rising significantly from early 1988 through early 1990. Foreign capital flows into the United States have assisted in financing the U.S. federal budget deficit. A weaker dollar would increase the threat of inflationary pressures in the U.S. stemming from increased costs for imported goods while stimulating the U.S. economy by encouraging increased U.S. exports, and would increase the pressures on U.S. monetary authorities to implement more restrictive monetary policies. That, in turn, would tend to raise global interest rates, restrain economic growth in the U.S. and abroad, and could worsen debt-servicing problems of developing nations.

Other countries also adopted more restrictive monetary policies in the 1980s as an effort to retard capital outflows to the U.S. Resulting relatively high non-U.S. real interest rates, along with movement of investment capital to the U.S., have held foreign economic growth well below the unusually strong levels of the 1970s. These interest rates pushed inflation rates of the late 1980s in most industrial nations well below the levels of the previous decade, although inflationary pressures increased somewhat in many countries from 1988 through early 1990.

From time to time in recent years, problems of debt and high real (inflation-adjusted) interest rates have caused uneasiness about the health of the U.S. and world financial systems. This concern comes from heavy involvement of some lending institutions in loans to developing nations experiencing difficulty meeting debt-servicing requirements, from heavy involvement in loans in higher-risk ventures such as real-estate, energy, agriculture, and mining where volatile prices create greater risk exposure, and from financial risk-exposure of lending institutions involved in foreign exchange transactions and the stock and bond markets. The global financial system could be placed under severe pressure in case of widespread defaults on developing nation loans or major losses from transactions in volatile financial, real-estate, energy, or raw-material markets. Occasionally, other concerns about the banking system stem from debt burdens of private U.S. firms, and from investment losses due to interest rate volatility. In the last few years, developing nations have made gradual progress in reordering their economies to meet debt-servicing requirements. Their progress and cooperation from international financial institutions have reduced concerns about the stability of the international banking system.

Adjustments of Developing Nations to Debt Burdens

Brazil, Mexico, and Argentina are the three most heavily indebted developing nations. Eastern Europe and several oil-exporting nations also have substantial debt burdens. In Latin America, debt burden adjustments have generally involved a four-dimensional approach: (1) reducing government spending, (2) restructuring debts to lengthen repayment period, (3) reducing nonessential imports, and (4) taking steps to increase exports. After experiencing severely reduced real economic output in the early 1980s, many Latin American countries have had slightly positive real economic growth recently.[34] But exports of countries such as Brazil and Argentina are creating increased competition for U.S. agricultural exports. Heavily indebted nations are under strong pressure to restrain imports and increase exports to meet debt-servicing costs.

Variations in world petroleum prices have a direct impact on the economic growth of Mexico, Venezuela, Nigeria, the Middle East, and other oil-exporting developing nations. Relatively low energy export prices have a negative impact on the debt-servicing ability of these countries, while helping to slightly ease debt problems of oil-importing nations. Conversely, rising energy prices increase aggregate demand for oil imports and improve the debt-servicing ability of oil-exporting nations and has a negative impact on the debt-servicing ability and economics of oil-importing countries. Fluctuations in world energy prices have been modest in the past two years, thus tending to dampen fluctuations in the energy-sensitive economies of developing nations.

China, India Remain Net Grain Importers

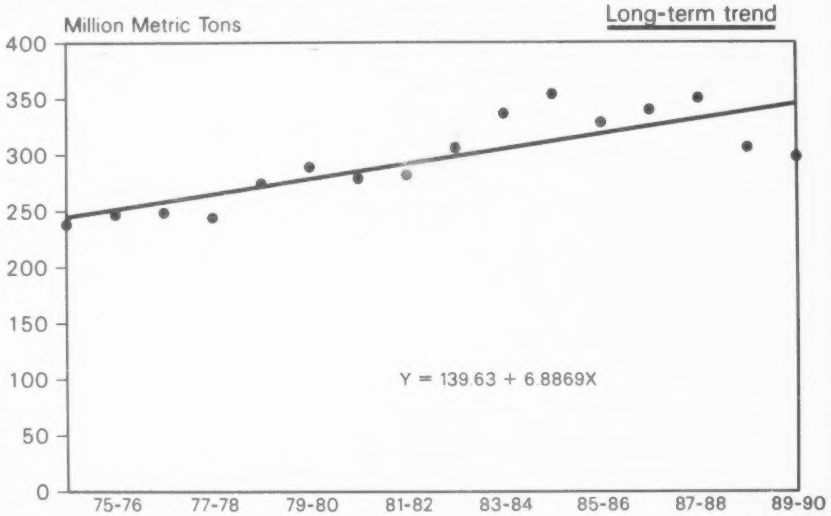
In 1987-88, China and India re-emerged as large importers of grain after being significant exporters during the previous three years. They remained net grain importers in 1988-89 and 1989-90. The reasons behind these shifts are of special importance to the world grain economy, because the countries are the world's two most heavily populated nations and represent over one-third of the global population. India's shift to a net import position was primarily due to a severe 1987-88 drought, while China's shift appears to be due to a combination of adverse weather, government adjustments in grain prices relative to those for other crops and related policy changes, and rapid internal demand growth stemming from expansion of industrial exports and growing consumer incomes. Since the early 1970s, both countries have occasionally been large importers of U.S. grain, often in response to weather problems. When such shifts to net importing positions occur, the results have been a reduction in foreign competition faced by U.S. grains in Far East markets and additional export opportunities for American grain in these two countries. A key consideration for private and public decision makers is whether this new source of import demand in 1988-89 and 1989-90 is temporary, or will continue in future years.

China

Before its adverse weather in 1987 and 1988, China's grain production grew at a sharply accelerated rate since the mid-1970s. The growth was due to the combined effects of increased use of technology and changes in its economic system (see Figure 27). Technological developments included construction of a large number of new fertilizer plants, increased use of fertilizer, expanded irrigation, improved varieties, and changes in government policies to encourage research. In the late 1970s, China also changed its economic system, allowing individual farm workers greater freedom in managing production and providing individual economic incentives to farm workers to market excess production for cash payments.[35] Increased domestic grain production made China a net exporter of corn and, at times, soybeans during the mid- to late 1980s. Its exports compete with U.S. grain and soybeans in Korea, Japan, and the USSR. In 1989-90, China remained a small net exporter of coarse grains, but continued to import wheat at a relatively high level, with preliminary estimates placing the total from all sources at 14 million metric tons, about double the 1985-86 level. Only a small part of the sharp increase in Chinese wheat imports from 1987-88 through 1989-90 appears to have been due to 1987 and 1988 weather problems and reduced carryover stocks. Chinese wheat production in 1989-90 was estimated to be 5 million tons above 1985-86. A growing population and consumer demand along with government sensitivity to political support of urban populations appear to have the main factors behind the growth of Chinese wheat imports since 1986-87. Reports from China indicate the inability of production to keep pace with growing consumption is partially due to a government decision to lower grain prices relative to those for other crops, along with inflation and lack of government cash payments to purchase inputs. With cash shortages, the Chinese government issued IOU's to farmers at some grain purchasing locations in both 1988 and 1989. These developments and a lifting of controls on urban prices of pork, eggs, fruit, and vegetables have caused a shift of cropland from grain to other products and growing demand for feed grains.

Future trends in Chinese grain and soybean imports will depend heavily on China's political stability, economic growth, grain pricing policies, and ability to generate further technological improvements in production through expanded agricultural research. Import patterns also will be influenced by trends in urban incomes and food consumption.[36] Events related to the 1989 student demonstrations have led to a sharp drop in foreign investment and tourist income in the country, at least temporarily slowing economic growth. A reemergence of political stability and increased access to international capital markets would bring an upward trend in Chinese per capita income. That would almost certainly lead to additional increases in consumption of meat and poultry and would limit the expansion of Chinese coarse grain and oilseed exports. As a result, China may be a net importer of these crops at times in the next several years, even when its crops are good. In addition, China may be a substantial and continuous importer of wheat in the next few years, with its imports increasing sharply in times of adverse weather and reduced yields. Some analysts indicate a 33 percent increase in total Chinese wheat imports from recent levels is quite likely by the year 2,000.[37] Future trends in Chinese agricultural production will depend not only on pricing systems and availability of cash to farmers and research, but also on possible improvements in transportation, storage, packaging, processing, and handling systems. There are indications that as much as 20 percent of China's agricultural output is lost due to deficiencies in these areas.[38]

Figure 27. Trend in Chinese Grain Production, 1974-75 through 1989-90.



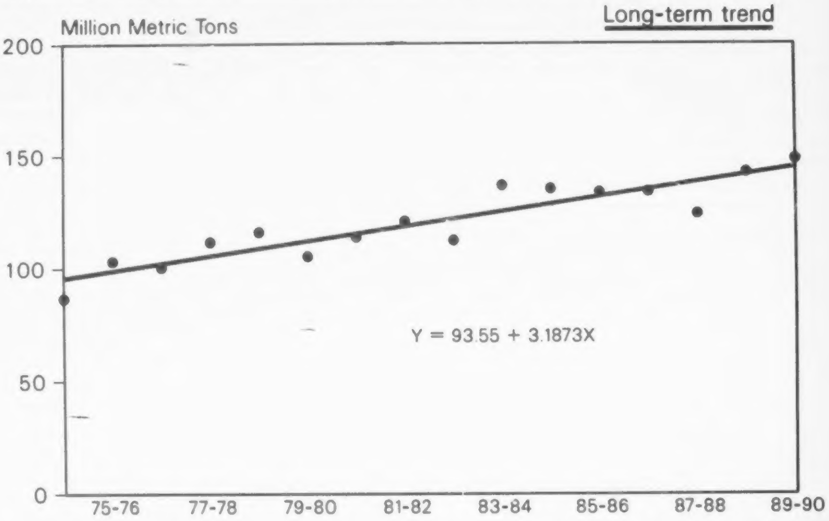
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 6-85, April 1985; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-87, April 1987; FG 3-88, March 1988; various other issues; *Foreign Agriculture Circular: World Agriculture Production*, WAP 1-88, January 1988; WAP 4-89, April 1989; WAP 4-90, April 1990.

India

India is the second most populous nation in the world. Its grain production capability is more variable than China's, partly because Indian grain production is heavily dependent on monsoon rains. Below-normal monsoon rains in 1987 sharply reduced India's grain production, causing the nation to halt exports, draw down carryover stocks, and import corn and sorghum in 1987-88 and wheat from 1987-88 through 1989-90. In addition, its imports of vegetable oils in 1987-88 increased sharply from levels of recent years and remained substantial through 1989-90. However, improved weather and sharply increased grain production in 1989-90 brought a substantial reduction in India's wheat imports from the relatively high level of the previous year. From the 1983-84 through 1986-87, India was a small exporter of wheat, feed grains, and protein meal while accumulating large carryover stocks of food grains.

As shown in Figure 28, India made recent impressive strides in grain production until the 1987 drought through the use of improved technology. Grain production increased because of better management, use of higher yielding varieties, and expanded use of fertilizer and irrigation. The 1987 drought reduced water supplies in irrigation reservoirs and wells, restraining the nation's grain production in 1988. Unless extended weather problems occur, improved management and technology are likely to push Indian grain production irregularly higher during the next several years. But, with its population of over 700 million people and variable weather patterns, India is likely to alternate from a grain exporting to an importing position from now through the late 1990s.

Figure 28. Trend in Indian Grain Production, 1974-75 through 1989-90.



Sources: Food and Agriculture Organization of the United Nations, *Trade Yearbook* (Rome, Italy), 1987; U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 9-76. May 1976; FG 20-78, November 1978; FG 5-80, February 1980; FG 4-81, January 28, 1981; FG 13-82, April 26, 1982; FG 26-83, September 9, 1983; FG 19-83, November 8, 1983; FG 2-85, January 1985; FG 7-85, May 1985; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-87, April 1987; FG 3-88, March 1988; *Foreign Agriculture Circular: World Crop Production*, WCP 4-87, April 1987; *Foreign Agriculture Circular: World Agricultural Production*, WAP 1-88, January 1988; WAP 4-90, April 1990.

U.S. Agricultural Exports, Imports, Trade Balance Rise in 1989

U.S. agricultural exports reversed their downward trend of the previous six years in the last half of calendar year 1987 and shifted into an uptrend that continued through mid-1990. The nation's agricultural exports for calendar year 1989 totaled $40 billion and 152 million metric tons. U.S. agricultural exports increased 8 percent from the previous year in dollar value due partly to a substantial rise in grain volume, which more than offset lower prices. The recent upward trend follows several years in which the dollar value of U.S. exports reflected declining prices for most major U.S. agricultural products, and sharply reduced U.S. grain export volumes. The volume of U.S. exports was reduced during the first half of the last decade by increasing supplies available from competing agricultural exporters, increased self-sufficiency of many importing nations, and slower growth in world consumption of farm products than in the 1970s.

But by 1987, foreign production and stocks of grain and some oilseeds were reduced significantly and continued to decline from 1988 through mid-1990. These declines were due in part to a severe 1987 drought in India, Pakistan, Thailand, and neighboring countries and a 1988 drought in Canada, parts of Eastern Europe, and the Southern Hemisphere. Crop problems in these areas, growth in the world economy and population, changing U.S. price support policies, and aggressive U.S. government export assistance programs were important factors behind increased U.S. farm product exports during the last three years. Tentative projections place total U.S. agricultural exports for the October 1989-September 1990 fiscal year at $40 billion, 1 percent above the previous year's $39.7 billion level but 8 percent below the 1980-81 record.

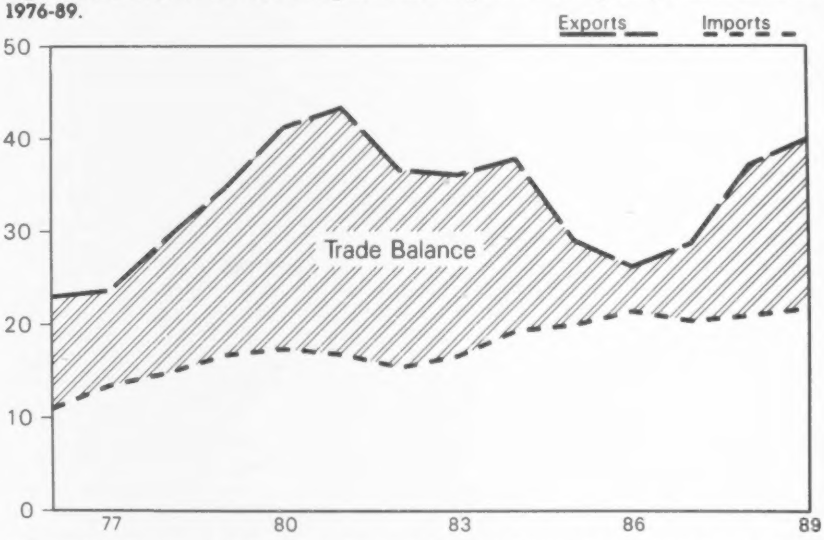
The value of U.S. agricultural imports has trended irregularly higher since 1985-86. Preliminary indicators point to another year of modestly increased U.S. agricultural imports in 1989-90. The nation's total imports of all agricultural products in fiscal 1988-89 totaled $21.5 billion, up 2 percent from the record 1987-88 level. With exports valued at $39.7 billion in fiscal 1988-89, the U.S. net trade surplus in farm products increased to $18.2 billion, about one-fourth larger than the previous year but about 19 percent less than the record trade surplus in 1980-81. The nation's agricultural trade balance is expected to remain approximately constant in 1989-90. The improved U.S. agricultural trade balance last year also was accompanied by a moderate improvement in the U.S. nonagricultural trade balance to a deficit of $138.6 billion, $11.9 billion smaller than the previous year's deficit.

While the U.S. agricultural trade balance is increasing, there is room for additional improvement. Continued improvement is important to the agricultural and nonagricultural sectors of the U.S. economy. For the agricultural sector, a further improvement in the trade balance would mean potentially increased income and improved financial health of production agriculture, as well as input industries such as farm equipment, seed, fertilizer, chemicals, and livestock. It also would mean increased employment in these and other sectors supplying agriculture, and in processing, handling, transporting, and exporting farm products. Increasing income and employment in these areas has a multiplier effect on economic activity in rural communities, resulting in increased agricultural related employment and economic activity in main street businesses of rural communities.

At national level, the net trade surplus in agriculture in past years helped pay for a significant part of the nation's imports of nonfarm products. As a result, it contributed to the economic well being of the U.S. population and helped to support the exchange rate of the U.S. dollar so that the cost of imported items remained reasonable. But the U.S. nonagricultural trade deficit has been so large in the last several years that the modest trade surplus in agriculture now offsets only about 13 percent of the total trade deficit.

Major imbalances in U.S. monetary and fiscal policies are partly responsible for the huge deficit in the nonagricultural sector. Fiscal policies reflect large federal budget deficits, and the need for those deficits to be financed partly through foreign investments in the U.S. That has created a strong demand for U.S. dollars abroad to be recycled back into the U.S. for investment purposes. And with a somewhat restrictive U.S. monetary policy, the world financial market and exchange rate mechanisms supplied those dollars to foreign investors through large U.S. imports. Nonagricultural U.S. exports in fiscal 1988 totaled $303 billion, up 17 percent from the previous year. At the same time, nonagricultural imports rose to $441 billion, an 8 percent increase from fiscal 1988. The resulting deficit in nonagricultural U.S. foreign trade of $138 billion far outweighed the $18.2 billion agricultural trade surplus. For comparison, the U.S. nonagricultural trade deficit in fiscal 1980-81 was $52.0 billion, and the U.S. agricultural trade surplus was $26.6 billion.

Figure 29. Dollar Value of U.S. Agricultural Exports and Imports, Calendar Years 1976-89.

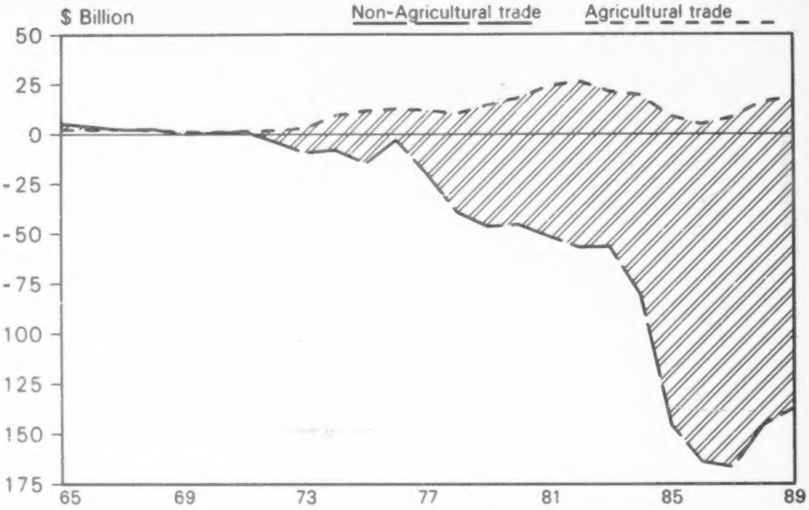


Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; January-February 1989; January-February 1990; various other issues.

If not substantially reduced soon, the large U.S. trade deficit will have important implications for U.S. economic growth and interest rates, and for the economic health of U.S. agriculture and other sectors heavily dependent on exports and/or sensitive to import competition. Policy tools for dealing with this problem will be discussed in a later section of this report. Preliminary indications point to a continued large, but modestly declining U.S. trade deficit in fiscal 1990.[39]

The sharp decline in U.S. agricultural exports in the first half of the 1980s was one of several factors behind severe economic pressures in U.S. agriculture and a sharp decline in asset values in the U.S. agricultural sector in the mid-1980s. Over the next several years, with near-normal weather in major foreign grain-producing areas, U.S. farm policies are likely to generate additional expansion of the nation's farm product exports. However, growth of U.S. agricultural exports are likely to remain well below the sharp upward trend of the 1970s and fiscal 1987-88 when foreign weather problems brought accelerated U.S. exports. Several more years of economic adjustment appear necessary before Eastern Europe, Latin America, and other developing nations fully recover from current debt, political, and economic problems. Some oil-exporting nations also are experiencing similar economic adjustments, with reduced availability of funds for farm product imports and possible slower economic growth in the years ahead. Future trends in the value of the U.S. dollar will be an additional influence on growth rates for U.S. agricultural exports. Although the agricultural export growth rate may slow from the average of the last two years, recent international developments should continue to encourage modest growth in the volume of U.S. agricultural exports in the 1990s.

Figure 30. Net U.S. Trade Balance in Agricultural and Nonagricultural Products, Calendar Years 1965-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; January-February 1989; January-February 1990; various other issues.

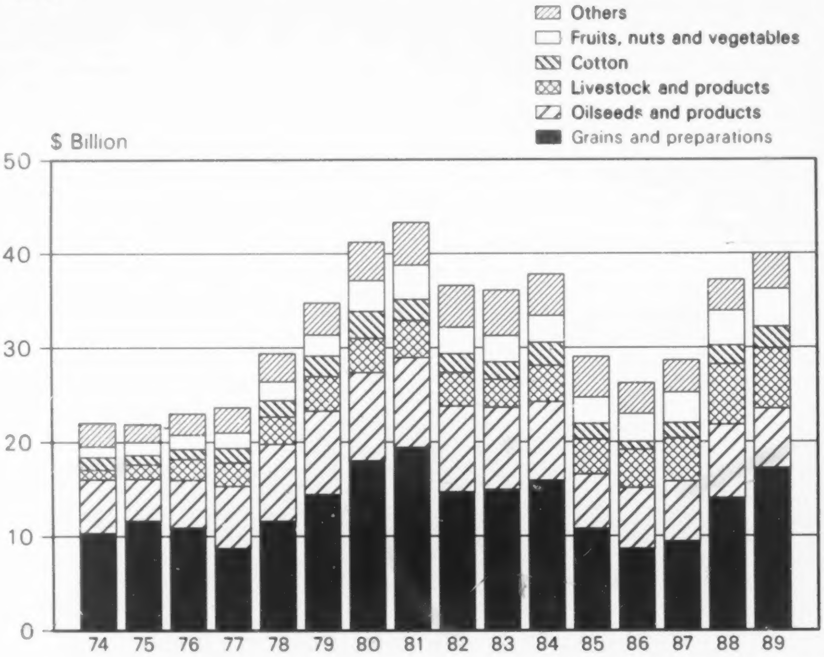
U.S. Agricultural Trade Trends by Commodity Groups

As shown in Figure 31 and Table 19, the dollar value of U.S. agricultural exports rose substantially in the 1988-89 fiscal year. Total agricultural exports were valued at $39.7 billion, 12 percent above the previous year's exports, but still moderately below the 1980-81 record. Increases in value occurred in 1988-89 in grains, animal products, poultry, fruits, vegetables, cotton, and seeds. Grain export values increased because of larger volumes and higher prices, reduced foreign supplies, and increased import demand in several countries. The quantity of U.S. feed grain exports in 1988-89 increased 15 percent after a sharp increase the previous fiscal year. Total value of the nation's feed grain exports rose by 42 percent. U.S. wheat exports increased 34 percent in value but dropped 7 percent in volume. U.S. cotton exports were down 5 percent in value, but up 4 percent in volume after large increases the previous year. Exports of oilseeds and oilseed products decreased both in volume and value for the year.

Composition of U.S. Agricultural Exports

Grain and oilseed exports, as indicated in Figure 31, accounted for a large part of the growth in value of U.S. agricultural exports from 1972 through 1981. These same products also accounted for much of the drop in value of exports from 1981 to 1986, declining by 55 percent in value during that period. Since 1986, the expansion in U.S. agricultural exports has been broad-based, covering value-added products as well as raw products such as grains. Due to strong international competition, oilseeds and meal have been exceptions to the uptrend. Livestock, dairy, and poultry exports now make up about 16 percent of all U.S. agricultural exports in dollar value. The value of these exports as a group in 1988-89 was 59 percent larger than the year of record U.S. agricultural exports eight years earlier, while cotton exports were about 1 percent smaller in value than eight years earlier. The value of fruit and vegetable exports dropped moderately in the mid-1980s but by 1988-89 was 24 percent larger than eight years ago because of a recovery in the past year. Grains, feeds, oilseeds, and oilseed products accounted for approximately two-thirds of the value of U.S. agricultural exports in recent years, but their share dropped to about 59 percent in 1988-89 due to a more rapid growth rate in exports of value-added products than in grains and oilseeds. Exports of grains are increasing in volume and value again in fiscal 1989-90 in

Figure 31. Value of U.S. Agricultural Exports by Commodity, 1974-89 Calendar Years.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; January-February 1989; January-February 1990; various other issues. Livestock excluding poultry and dairy products.

Table 19. Value of U.S. Agricultural Exports by Type of Commodity, 1976-77, 1980-81, 1985-86, and 1988-89 in Billions of Dollars.

Commodity Group	October-September Fiscal Years 1976-77	1980-81	1985-86	1988-89	Percentage of 1988-89 Total Exports
Feed grains	5.39	10.40	3.75	7.25	18.28
Oilseeds	4.64	6.98	4.39	4.40	11.10
Oilseed meal	0.97	1.67	1.13	1.32	3.32
Vegetable oils	0.77	1.10	0.75	0.09	0.23
Wheat and wheat products	3.05	8.05	3.55	6.39	16.11
Rice	0.69	1.54	0.65	0.10	0.24
Meat and meat products	0.61	0.99	1.01	2.36	5.94
Hides and skins	0.80	1.00	1.44	1.71	4.32
Dairy products	0.17	0.24	0.43	0.48	1.20
Poultry and poultry products	0.30	0.77	0.46	0.73	1.84
Other animals and animal products	0.77	1.11	1.01	1.27	3.21
Cotton	1.54	2.23	0.68	2.04	5.14
Fruits, vegetables, and nuts	2.45	3.56	2.91	3.94	9.94
Tobacco	1.08	1.34	1.32	1.27	3.21
Others	0.78	1.63	2.82	6.32	15.93
Total	24.01	42.61	26.30	39.65	100.00

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1989, November-December 1988; November-December 1987; November-December 1982, and November 1977.

response to growing foreign demand, competitive U.S. prices, and weather-reduced crops in some foreign producing areas. The value of U.S. grains, feeds, oilseeds, and oilseed products in 1988-89 was 22 percent lower than eight years earlier. Thus, the composition of U.S. exports in recent years has shifted toward more value-added products and products with relatively high per unit value.

U.S. Agricultural Imports

In previous editions of this report, it has been noted that sustained trading relationships require a two-way exchange between trading partners. The United States must be willing to import from countries that purchase U.S. products and services in order to maintain a lasting trading relationship. Products Americans buy from other countries generate earnings those countries can use to purchase U.S. exports. In this process, trading partners usually export products that can be produced more efficiently at home. These same trading partners also tend to import products that can be produced more economically by their trading partners. Through this process, both participants can increase their standards of living and carry on a substantial trading relationship over an extended period of time.[40] Because of this principle of comparative advantage, the U.S. imports a sizable volume of certain agricultural commodities.

Table 20. Value of U.S. Agricultural Imports in 1975-76, 1984-85, 1985-86, and 1988-89 October-September Fiscal Years by Commodity Groups in Billions of Dollars.

Product	1975-76	1984-85	1985-86	1988-89	Percent Change 1975-76 to 1988-89
Complementary Imports:					
Cocoa and chocolate	0.60	1.29	1.19	0.97	+62
Coffee	2.39	3.24	4.40	2.47	+3
Rubber	0.47	0.68	0.61	1.05	+124
Tea	0.09	0.18	0.14	0.13	+48
Bananas and plantains	0.26	0.75	0.74	0.85	+227
Drugs	0.11	0.20	0.18	0.22	+100
Others	0.28	0.43	0.54	0.54	+94
Total complementary imports	4.21	6.78	7.80	6.24	+48
Supplementary Imports:					
Dairy products	0.26	0.76	0.79	0.83	+221
Hides and skins	0.20	0.24	0.20	0.24	+20
Meat and meat products, excluding poultry	1.44	2.21	2.25	2.43	+69
Poultry and poultry products, excluding eggs	0.09	0.08	0.09	0.13	+44
Other animal products and animals	0.33	0.86	0.96	1.25	+278
Total animals and animal products	2.31	4.15	4.28	4.89	+112
Fruits, nuts, vegetables, and products	0.88	2.49	2.80	3.34	+279
Sugar and products	1.35	1.28	1.00	0.95	−30
Alcoholic beverages	0.43	1.55	1.78	1.82	+322
Oilseeds and products	0.54	0.78	0.64	0.95	+75
Grains, grain products, and feed	0.23	0.60	0.67	1.14	+395
Tobacco	0.28	0.56	0.61	0.52	+86
Others	0.30	1.55	1.30	1.65	+449
Total supplementary imports	6.31	12.96	13.07	15.24	+142
Total agricultural imports[a]	10.51	19.74	20.88	21.48	+104

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1989; November-December 1988; November-December 1987; November-December 1986; November-December 1985; and November 1977.

[a] Totals may not add due to rounding.

Table 20 shows the composition of the value of U.S. agricultural imports in 1988-89 and comparisons with recent years. Approximately 29 percent of the value of all U.S. agricultural imports is represented by products not produced commercially in the United States or produced only in very small quantities because of climatic limitations. These products are classified as complementary or noncompetitive imports because they do not compete directly with domestic production. Coffee, tea, rubber, cocoa, legal drugs, spices, bananas, and other tropical fruits are included in this category. The largest single commodity in dollar value in this group, coffee, accounted for 40 percent of the value of all complementary agricultural products in fiscal 1988-89 decreased by 4 percent from the previous year. Lower prices for coffee, cocoa, spices, and essential oils more than offset higher prices for some other products. Value of supplementary agricultural product imports increased by 5 percent in the 1988-89 fiscal year, with increases in the value of poultry products, wool, vegetable products, sugar, oilseed products, and fruit imports and decreases in the value of imports of pork, beef, dairy products, tobacco, and beverages.

Supplementarty imports are products that compete with domestic production. As shown in Table 19, the six largest supplementary import groups and percentages of total supplementary imports are: (1) fruits, vegetables, and associated products (20 percent); (2) meat and meat products (16 percent); and (3) alcoholic beverages (12 percent); (4 and 5) sugar and oilseeds (6 percent); and (6) dairy products (5 percent). Despite a restrictive U.S. sugar import policy and sharply declining sugar imports, U.S. sugar and sugar product imports are still a sizable supplementary import group. While the United States is a large net exporter of oilseeds, oilseed products, grains, and feeds, it also imports small quantities of these products. With the exception of palm oil, coconut oil, and at times South American soybean oil, these imports usually originate in Canada and represent marketings from elevators, processors, and farmers located near the U.S. border. Likewise, modest quanitites of U.S. products flow across the U.S. border into Canada. However, the strong U.S. dollar relative to the Canadian dollar in recent years has discouraged this and encouraged increased U.S. imports of Canadian products. U.S. imports of palm oil originate largely in Malaysia, with the volume varying depending on the price advantage relative to soybean oil. U.S. coconut oil imports typically come from the Philippines. Health concerns have significantly reduced U.S. imports of these two products in the past two years.

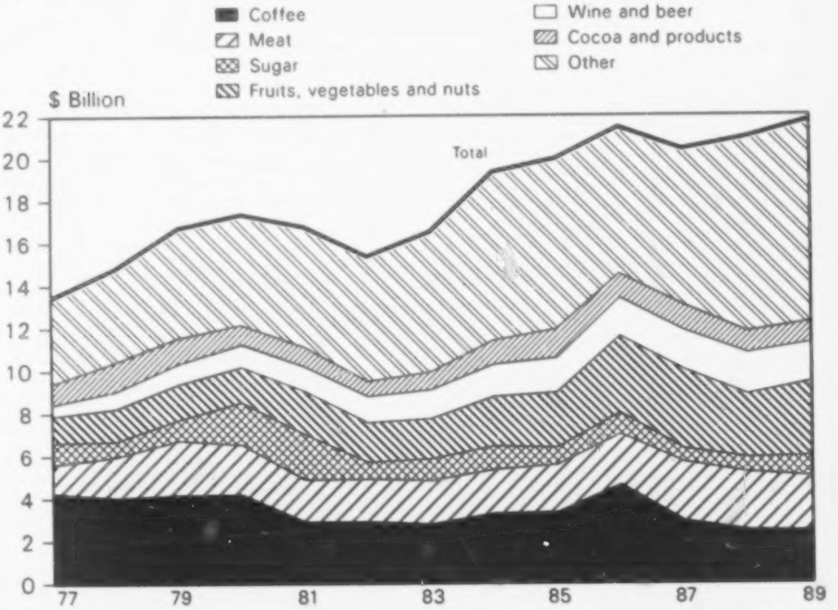
Figure 32 shows the trend in U.S. imports of agricultural products by major commodity groups since the mid-1970s. The value of sugar imports has dropped sharply since the early 1980s because of lower sugar prices and technological developments in corn processing that brought sharply increased use of high-fructose corn sweeteners as a substitute for sugar in U.S. soft drinks and processed foods. U.S. exports of livestock products and imports of red meat are shown in Figures 33 and 34.

U.S. Agricultural Exports by Leading States and by Economic Groupings of Destinations

The value of U.S. farm product exports by the 10 leading states for the past three fiscal years is shown in Figure 35. The top 4 exporting states in 1988-89 were California, Nebraska, Iowa, and Kansas, in that order, with other top-ranking exporting states located in major grain-producing areas of the Midwest and Pacific Northwest. Nebraska, Iowa, and Kansas are large exporters of grains, soybeans, soybean products, and livestock. Exports from California reflect greater diversity and include fruits, vegetables, cotton, and nuts, along with grain and livestock products. The relative ranking of the top 10 agricultural exporting states changed dramatically in 1988-89, after remaining relativley stable during the previous six years. Nebraska, in 1988-89 moved up to the number 2 ranking from sixth place the previous year while Kansas retained its number 4 position for the second consecutive year, after displacing Texas from that position in 1987-88. The increased rankings for Nebraska and Kansas in 1988-89 reflected less severe weather problems and relatively better crops in those 2 states in 1988, as well as growth in value-added exports from the livestock industry.

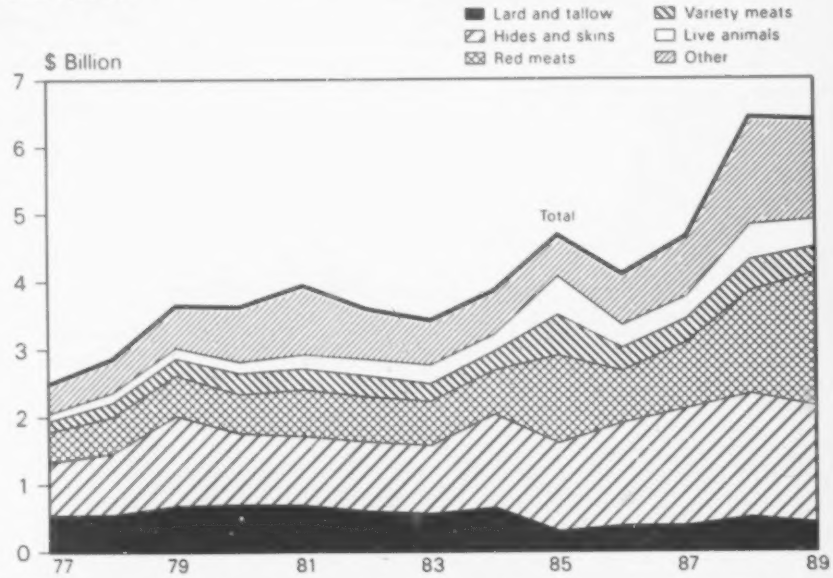
Figures 36 through 38 show total U.S. agricultural exports and wheat and corn exports by geographic destinations now and in the late 1970s. Western Europe declined sharply as a market for these

Figure 32. Value of U.S. Agricultural Imports by Commodity, Calendar Years 1977-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; January-February 1989; January-February 1990; various other issues. Note: "fruits, vegetables, and nuts" category includes bananas. "Other" category includes dairy products, oilseeds and products, rubber, and other imports.

Figure 33. Value of U.S. Livestock Product Exports by Type of Product, Calendar Years 1977-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; January-February 1989; January-February 1990; various other issues. Poultry exports are included in the "other" category.

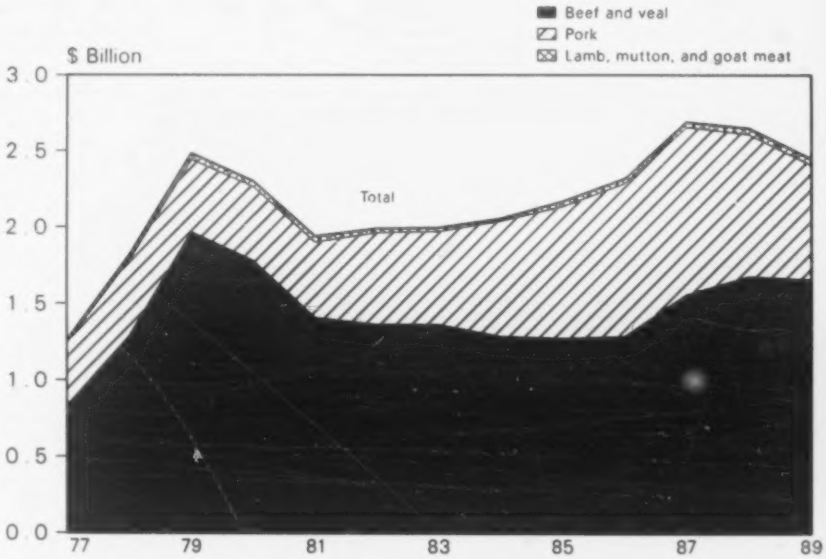
products in the decade of the 1980s and has now become a major competitor of the U.S., while Japan and less-developed countries have grown substantially in importance as a market for U.S. corn. For combined exports of all U.S. farm products, major growth areas since the late 1970s include Latin America, Southeast and East Asia, and Japan. Moderate growth occurred in U.S. exports to North Africa. U.S. agricultural exports to Eastern Europe were relatively small in the earlier time period, but declined moderately in the 1980s due to negative impacts from debt burdens.

Trends in U.S. Corn and Coarse Grain Exports by Destination

Figures 39 and 40 show a dramatic change in the level and destination of U.S. corn and coarse grain exports since the late 1970s. During the 1960s and 1970s, the industrial economies of Western Europe and Japan represented the largest foreign outlets for these U.S. grains by a wide margin. Since 1979-80, however, the size of the once large EC market for U.S. corn has dropped sharply along with a modest decline in exports to other West European nations. The traditionally stable Japanese and Republic of Korea markets also have declined slightly in relative size as other competitors have taken steps to export to these nations and as markets in developing countries expanded. China, after being a market outlet for U.S. corn from 1975-76 through 1982-83, stopped purchasing U.S. corn beginning in 1983-84 and has become a net corn exporter. Although China imported small amounts of U.S. corn at times in the last three years, it continues to export some corn to neighboring Far East countries and is expected to remain a small net corn exporter for the 1989-90 marketing year. Chinese exports were an important factor behind declining U.S. corn and coarse grain exports to the Republic of Korea and Japan in the early to mid-1980s. But diminished Chinese competition helped to increase U.S. corn exports to these nations from 1987-88 through 1989-90.

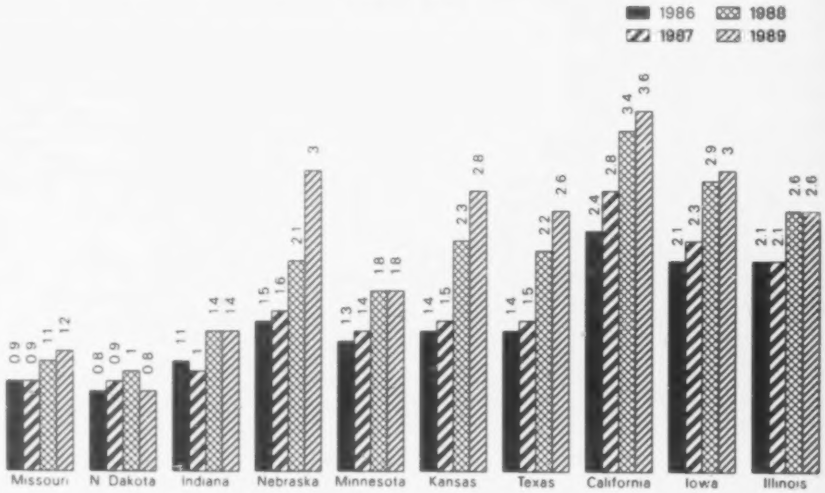
Partially offsetting these trends has been an increased importance of Latin America and the Middle East as a market for U.S. corn along with modest growth in exports to Eastern Europe. The most dramatic change in U.S. corn and coarse grain exports, however, was the extremely sharp decrease in USSR purchases in 1985-86, small purchases in the following two years, and sharp increases in 1988-89 and 1989-90.

Figure 34. Value of U.S. Red Meat Imports by Type of Product, Calendar Years 1977-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1988; Jaunary-February 1989; January-February 1990; various other issues.

Figure 35. Value of U.S. Agricultural Exports by Selected States in Billions of Dollars, Fiscal Years 1985-86 through 1988-89.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, March-April 1988; March-April 1989; various other issues; *U.S. Agricultural Trade Update*, March 1990; and personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Imports of U.S. corn by the Soviet Union in the 1986-87 and 1987-88 marketing years were less than half the record 1984-85 level. The Soviet Union accounted for about one-third of all U.S. corn exports in the 1984-85 marketing year and one-sixth in the next three years. The sudden surge in Soviet purchases of U.S. Corn in 1984-85 reflected that nation's serious 1984 crop problems due to widespread drought and record livestock inventories early in the season. The sharp increase in its imports of U.S. corn in 1988-89 reflected a repeat of production problems in its 1988 coarse grain crop and sharply reduced availability of corn from Argentina, normally its second-ranking source of supply for corn. The April-May 1989 Argentine corn harvest was far below normal because of severe drought and reduced area devoted to corn.

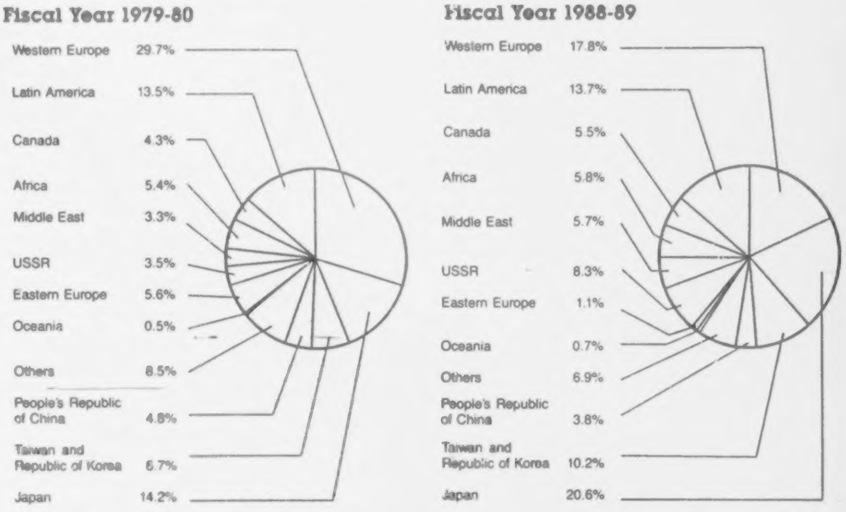
Preliminary indications show potential for slightly decreased total U.S. corn and coarse grain exports in 1990-91. The exact level of shipments will be influenced by the size of foreign crops, especially by the outcome of the 1990 USSR grain and forage harvests, and incentives being offered to Soviet farmers to increase grain production and sales. Several developments, including U.S. government agricultural programs and slower growth of foreign grain production, appear to be setting the stage for continued modest growth in U.S. corn and coarse grain exports in the next few years. But global debt problems and slower world economic growth are likely to hold export growth rates during this period well below those of the rapid-expansion period of the 1970s.

Trends in U.S. Soybean and Soybean Product Exports by Destination

For nearly three decades, the industrial economies of Western Europe and Japan have been the major foreign outlets for U.S. soybeans and soybean meal, with soybean meal being an important input for livestock and poultry production (see Figures 41 and 42). U.S. soybean oil exports, on the other hand, are shipped primarily to developing nations where they are used for human consumption as cooking oils (see Figure 43). Until 1982-83, U.S. soybean and soybean meal exports exhibited a strong and relatively stable upward trend driven by growing consumer demand for livestock and poultry products and limited growth of competing protein meals.

Growth in foreign demand for U.S. soybeans and meal during the past two

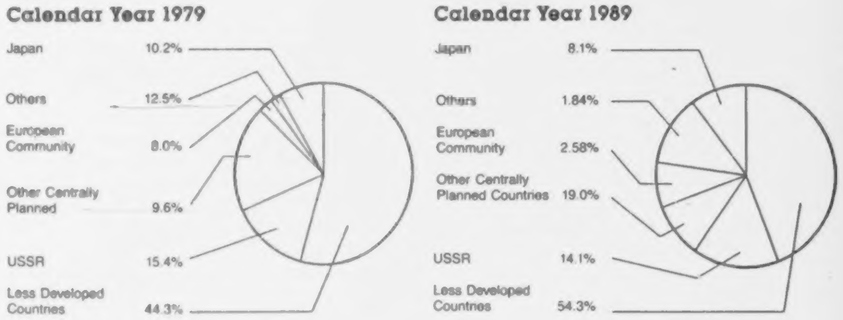
Figure 36. U.S. Agricultural Export Percentage Shares in Value to Selected Destinations, 1979-80 and 1988-89 Fiscal Years.


Fiscal Year 1979-80

Fiscal Year 1988-89

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1987; November-December 1988, November-December 1989; and Fiscal Year 1987 Supplement; and personal communications with officials of U.S. Department of Agriculture, Economic Research Service.

Figure 37. U.S. Wheat Export Percentage Shares to Selected Destinations, 1979 and 1989.


Calendar Year 1979

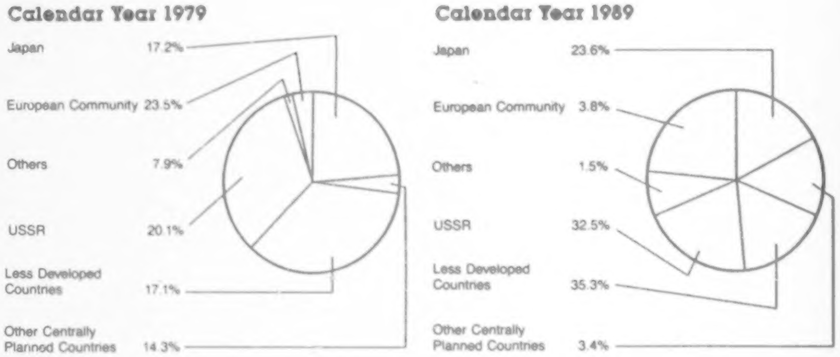
Calendar Year 1989

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1990; and calendar year 1980 supplement. Country groups are defined according to *Foreign Agricultural Trade*, calendar year 1987 supplement.

decades was greatest in the European Community, which, until recently, accounted for approximately two-thirds of all U.S. soybean meal exports and approximately half of U.S. soybean exports. Growth in the EC market during the 1970s was encouraged by rising consumer incomes, high domestic EC support prices for grain, a weak U.S. dollar, and an absence of EC import restrictions on soybeans and soybean meal. The EC's Common Agricultural Policy (CAP) maintained internal grain prices well above world levels. A complex price support mechanism automatically adjusted EC grain prices for changes in the exchange rate of the U.S. dollar as it affected grain import costs. In contrast, soybean and meal imports enter the EC at world price levels, with a weak U.S. dollar enhancing soybean meal's attractiveness as a feed ingredient. The combination of EC support prices for coarse grains sharply above the world levels and EC soybean meal priced at world levels created a soybean meal/corn price ratio in the EC much more favorable for soybean meal feeding than in the U.S. and most other nations. As a result, soybean meal in the EC was fed both as a protein source and as an energy source or grain substitute.[41] In years when world grain and soybean prices rise sharply, the relatively steady EC internal grain prices and rising soybean meal prices tend to reduce EC soybean and soybean meal imports and soybean meal feeding substantially, as in 1983-84 and in 1988-89.

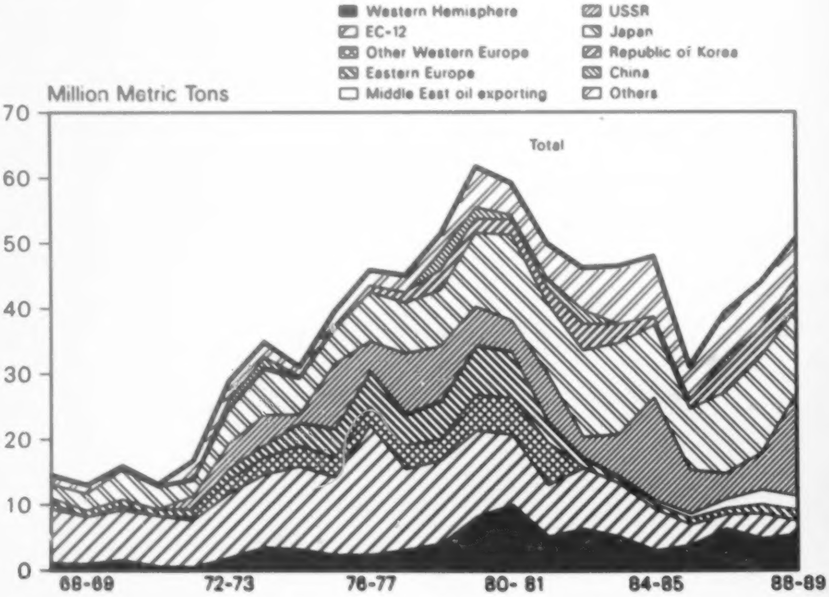
Other contributing factors behind the sharply lower EC purchases of U.S. soybeans and meal in recent years include: (1) a sluggish general economy with slower growth in EC incomes than in the 1970s and high unemployment, (2) a dairy surplus reduction program that sharply reduced manufactured dairy feed sales beginning in 1984-85,[42] (3) sharply expanded EC wheat feeding, and (4) large imports of U.S. corn gluten feed and meal as a substitute for soybean meal and high domestic oilseed support prices. Wheat has a higher protein content than corn, which it replaced in livestock and poultry rations, thus reducing soybean meal requirements. Corn gluten feed and meal are by-products of the U.S. corn sweeteners and alcohol fuels industry, with around 3.5 million metric tons of these products exported annually to EC in the last five years.[43] U.S. soybean meal exports to EC in 1988-89 totaled only 0.6 million metric tons, down sharply from about 3.9 million tons in 1979-80.

Figure 38. U.S. Corn Export Percentage Shares to Selected Destinations, 1979 and 1989.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1990; and calendar year 1980 supplement. Country groups are defined according to *Foreign Agricultural Trade of the United States*, calendar year 1987 supplement.

Figure 39. U.S. Corn Exports by Destination, October-September 1966-67 through 1988-89.[a]



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues; *Grain Market News* (Independence, Mo.), various issues; and Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1987; November-December 1988; November-December 1989.

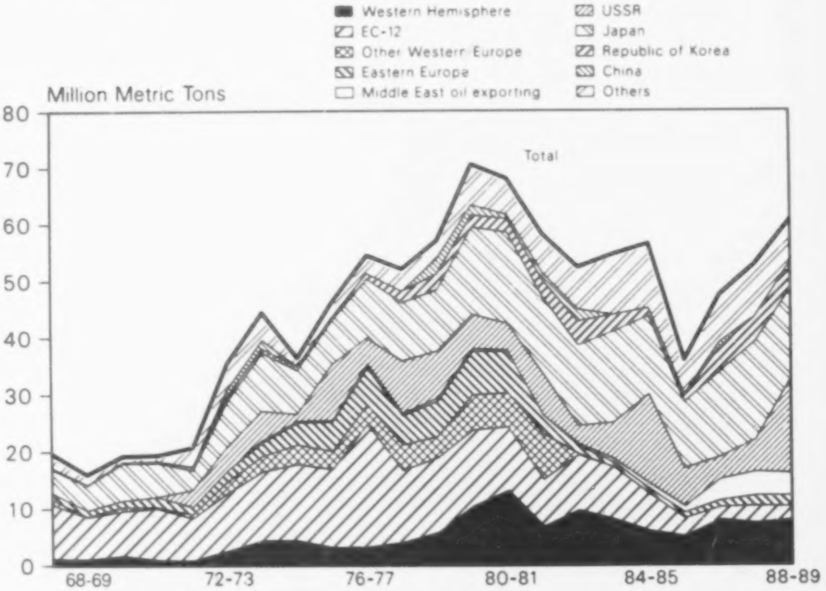
[a] From 1982-83 on, the EC is EC-12.

A modest upward trend in U.S. soybean and soybean meal exports since 1985-86 reflects accelerated economic growth in a number of foreign countries and expanding demand in centrally planned nations. Additional factors include an improvement in economic conditions in the West European livestock sector and temporarily reduced oilseed competition from Canada and EC in 1989 and early 1990, due to weather problems in these two areas.

U.S. soybean and soybean meal exports in the years ahead will depend heavily on the exchange rate of the U.S. dollar; EC oilseed, livestock, and dairy policies; and world economic growth as well as Canadian and South American oilseed production. The strengthening dollar in the early 1980s created a price shock in EC meal markets similar to that from a short U.S. crop. Strength of the U.S. dollar in late 1989 and early 1990, after a decline in the mid-1980s, may slightly temper future growth in U.S. bean and meal exports,[44] but may be offset by growth in exports to Eastern Europe and the USSR as those nations seek to improve efficiency of their livestock sectors. Growth rates are likely to remain significantly above those during the mid- to late 1980s but well below those of the 1970s because of slower growth in the world economy, continued restraints from debt problems in developing nations including Eastern Europe, and increased foreign oilseed production.

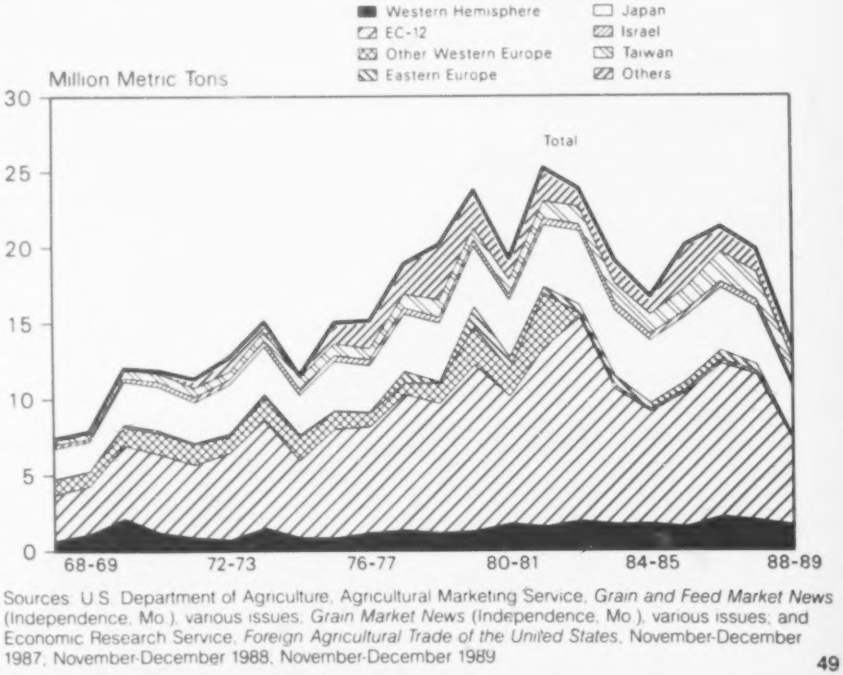
In contrast to U.S. soybean meal and soybean exports, major foreign markets for soybean oil are primarily developing nations in Asia, Africa, and Latin America. As Figure 43 indicates, U.S. soybean oil exports have been highly variable from year to year for more than two decades. Short-term fluctuations in exports are due largely to changes in production of major competing foreign vegetable oils, animal fats, marine oils, and changes in U.S. soybean oil supplies and prices. Export demand for U.S. soybean oil is highly price inelastic. In other words, large changes in prices are needed to bring significant increases or decreases in exports, provided all other market influences remain unchanged. For example, U.S. soybean oil exports dropped sharply in 1983-84, not because of reduced demand, but primarily due to drought-reduced U.S. soybean supplies, limited availability of U.S. soybean oil for export, a sharp rise in soybean oil prices, and the rationing effect on exports resulting from the higher prices. To bring about the required sharp decline in U.S. exports, soybean oil prices in late 1983 and early 1984 rose

Figure 40. U.S. Coarse Grain Exports by Destination, October-September 1967-68 through 1988-89.*



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues; *Grain Market News* (Independence, Mo.), various issues; and Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1987; November-December 1988; November-December 1989.
*From 1982-83 on, the EC is EC-12.

Figure 41. U.S. Soybean Exports by Destination, October-September 1967-68 through 1988-89.



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues; *Grain Market News* (Independence, Mo.), various issues; and Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1987; November-December 1988; November-December 1989.

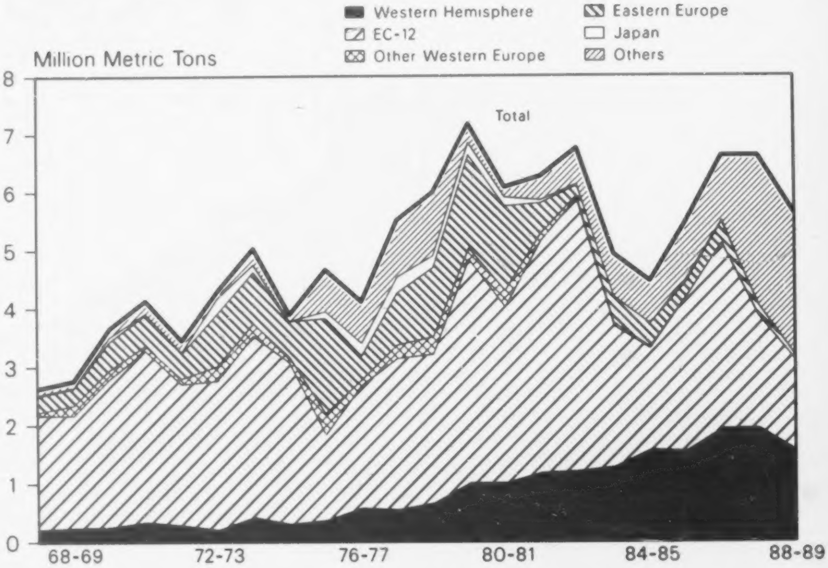
more than 50 percent above the average level of previous years. The strong dollar and debt burdens of developing nations also tended to reduce 1983-84 soybean oil exports. But with a high percentage of U.S. soybean oil exports shipped under government financing programs, these factors tend to be slightly less significant than in grain and soybean exports.

U.S. soybean oil exports in the 1988-89 fiscal year were moderately above the 1986-87 season's severely depressed level but well below the peak level of 1979-80 and down 11 percent from the previous year. Exports to India remained sharply below previous peak levels despite its drought-reduced 1987 oilseed crops and a resulting draw-down of its carryover stocks going into the 1989-90 marketing year. U.S. soybean oil sales to India were reduced in part by strong competition from Malaysian palm oil. U.S. soybean oil exports to Pakistan and Africa and most other destinations in 1988-89 increased from a year earlier, while those to Africa declined and U.S. soy oil exports to Bangladesh dropped to zero. World palm oil production has been moderately variable from year to year, depending on weather conditions in major producing areas. The long-term upward trend in Malaysian production was temporarily interrupted in late 1986 and early 1987, before turning upward later in 1987, 1988, and 1989.

An abrupt change in the global soybean oil situation occurred in 1985-86 with the new trend continuing into mid-1988-89. With substantially increased U.S. soybean and Malaysian palm oil production, global soybean and vegetable oil stocks rose sharply and were still at relatively high levels in mid-1989. Increasing stocks pushed soybean oil prices sharply below average levels of the previous six years. Carryover stocks then shifted into a downward trend in 1989-90 with growing world demand and an especially strong increase in U.S. domestic consumption. Early indications are that world vegetable oil and soybean oil stocks will decline somewhat further in the year ahead, permitting at least a modest increase from 1989-90 in average U.S. and world soybean oil prices.

As a background for evaluating U.S. soybean oil export prospects, Figure 43 shows a modest long-term upward trend in exports until the early 1980s, despite large year-to-year fluctuations. Since then, U.S. exports have trended lower in the face of growing

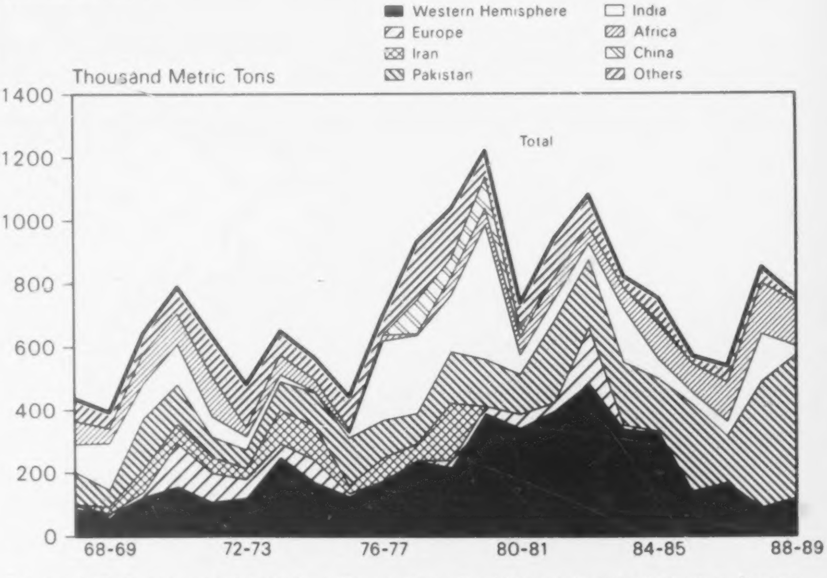
Figure 42. U.S. Soybean Meal Exports by Destination, October-September 1967-68 through 1988-89.[a]



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues; *Grain Market News* (Independence, Mo.), various issues; Foreign Agricultural Service, *Foreign Agriculture Circular: Oilseeds and Products*, FOP 11-86, November 1986, U.S. export sales April 3, 1986, and April 2, 1987; and Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988; November-December 1989.

[a] From 1983-84 on, the EC is EC-12.

Figure 43. U.S. Soybean Oil Exports by Destination, October-September 1967-68 through 1988-89.



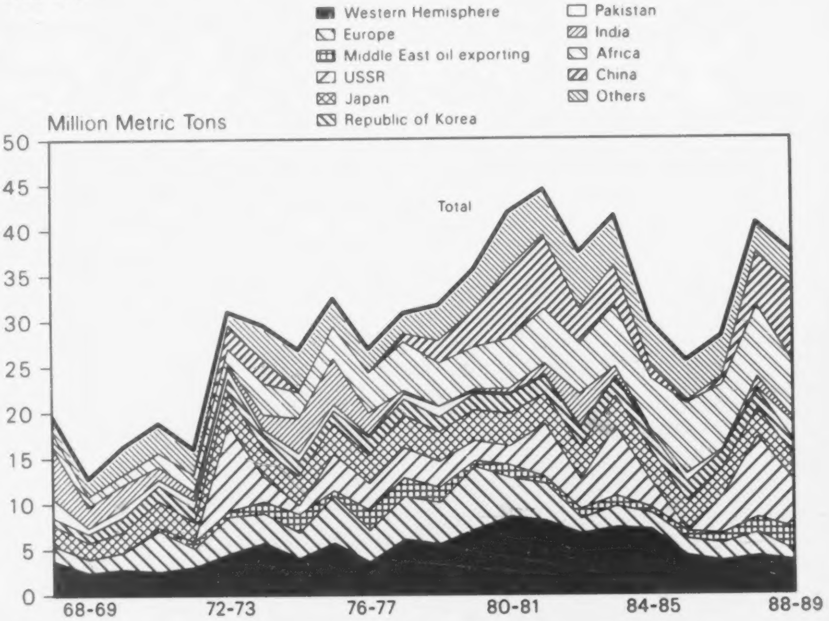
Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Oilseed and Products*, various issues, U.S. export sales April 3, 1986, and April 2, 1987; and Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988, November-December 1989.

competition. Basic growth in demand for vegetable oil reflects an annual population growth of more than 2 percent in most developing nations. In addition, per capita fat oil consumption in these countries remains low and consequently is moderately sensitive to changes in per capita incomes. The long-term upward trend of population and incomes in developing countries appears likely to push U.S. soybean oil exports irregularly higher in the years ahead. Growth will be restrained somewhat by expanded production of palm and rapeseed oil. In contrast to developing nations, per capita fat and oil consumption in most industrialized nations already is large and is expected to increase only slowly. Thus, developing countries are likely to remain the leading export markets for U.S. soybean oil. Because soybean oil competes with a wide range of other fats and oils, large year-to-year fluctuations in U.S. soybean oil exports are likely to continue in the foreseeable future, due to fluctuations in weather and production of competing products.

Major products that compete with soybean oil are butter, lard, tallow, sunflowerseed oil, cottonseed oil, peanut (groundnut) oil, palm oil, coconut oil, safflower oil, olive oil, and fish oil. Compared to many competing oilseeds, soybeans have a relatively low oil yield (18 percent) and a relatively high protein meal yield (80 percent). Long-term global demand for soybean meal has grown more rapidly than the demand for soybean oil, partly because of strong dietary shifts toward more meat and poultry consumption. That shift continues to occur as incomes increase in rapidly and moderately developing economies. This has generated long-term growth in demand for fats and oils. In addition, soybeans have faced strong competition from rapid growth in production of several high-oil-content oilseeds, but relatively less competition in meal markets.

In the years ahead, indicators point to continued increases in competition from palm oil production and exports that will continue to restrain long-term growth of U.S. soybean oil exports. Tree plantings in major producing regions of Malaysia expanded sharply in recent years and may continue to expand into the early 1990s. In addition, improved management practices may increase palm oil production per hectare in the years ahead.

Figure 44. U.S. Wheat Exports by Destination, October-September 1967-68 through 1988-89.



Sources: U.S. Department of Agriculture, Agricultural Marketing Service, *Grain and Feed Market News* (Independence, Mo.), various issues; *Grain Market News* (Independence, Mo.), various issues; and Economic Research Service, *Foreign Agricultural Trade of the United States*, November-December 1987; November-December 1988; November-December 1989.

From the viewpoint of the U.S. soybean industry, those forces indicate a need for continued priority on market development for soybean oil in developing nations, and for continued efforts to develop new industrial products from soybean oil.

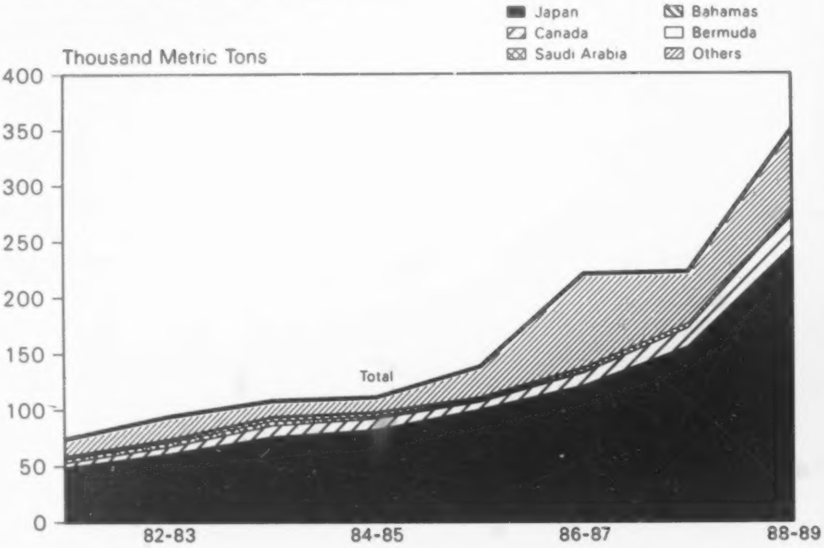
U.S. Wheat Exports by Destination

Figure 44 shows substantial changes in the destinations of U.S. wheat exports since the late 1970s. The most pronounced changes in 1986-87 through 1988-89 were abrupt increases in USSR and Chinese purchases of U.S. wheat after low levels of purchases or absences from the U.S. market the previous three years. U.S. wheat exports to the Middle East also increased sharply during the last few years, reflecting heavy targeting of the U.S. Export Enhancement Program (EEP) to several countries in that area. Reduced European imports since the early 1980s reflect increased wheat production in that area. While Western Europe is now a large net exporter of wheat, much of its crop consists of soft wheat varieties. The U.S. continues to export some hard wheat and durum wheat to Western Europe to meet specific needs.

U.S. wheat exports to Latin American nations continued a long upward trend until 1987-88, when improved production and reduced purchasing power brought a three-year down-trend in exports. The Western Hemisphere and Africa together accounted for slightly over half of all U.S. wheat exports in the 1986-87 marketing year. But their share of U.S. wheat exports fell to about one-third in 1987-88 and slightly over one-fourth in 1988-89. Exports to India dropped to zero in 1985-86 and 1986-87 as a result of that nation's increased domestic production, large carryover stocks, and its internal pressure to export wheat. However, severe Indian drought in 1987 prompted imports of U.S. wheat in 1988-89.

Future trends in U.S. wheat exports will depend on how extensively the Export Enhancement Program (EEP) is used. The program was begun in mid-1985 and has been used aggressively since then. Other influences on U.S. wheat exports will include foreign production trends, an expanding global population, and expected modest world economic growth. The EEP is intended to meet subsidized competition from other wheat exporters, and is expected to be given substantial emphasis for the next few years. Depending on foreign weather and production responses of other exporters to reduced world wheat prices, the EEP may set the stage for slight growth in U.S. wheat exports in the early 1990s. But, technological developments in wheat production in India, China, and the EC are likely to generate significant competiton in world wheat export markets provided weather is favorable. Foreign supplies may be moderated slightly by shifts of some marginal land away from wheat production in Canada, Argentina, and Australia in response to reduced world wheat prices. Price uncertainty also may encourage some reduction in fertilizer application rates on wheat in Canada and the Southern Hemisphere wheat producing countries. That reduction may slow the upward trend in their respective wheat yields. Prospective yield and production trends for the next few years remain uncertain in the USSR and Eastern Europe, but a shift to market-directed agricultural sectors may encourage some expansion in wheat output of these areas in the next few years.

Figure 45. U.S. Beef and Veal Exports by Major Destinations, 1981-82 through 1988-89 October-September Fiscal Years.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988; November-December 1989; various other issues.

Figure 44 shows large year-to-year variations in U.S. wheat exports during the past two decades. This variability is likely to continue and will contribute to significant year-to-year changes in U.S. and world wheat prices. Variability of U.S. exports is related partly to fluctuating production in four important areas: India, China, the USSR, and Australia. The first three are populous nations with a history of substantial variations in rainfall and temperatures from one year to the next. Their import requirements are inversely related to the size of domestic production.

Australia has a highly variable climate, is sparsely populated, and is a major exporter of wheat. When Australia's weather is favorable for wheat production, the U.S. tends to face increased competition in world wheat markets. In contrast to the U.S., Australia, and other wheat exporting nations do not have a policy of accumulating reserve stocks when production is large. As a result, with good world crops, the U.S. often is left as a residual supplier to world markets. When world supplies are large and world prices are low, the U.S. traditionally accumulates reserve stocks to support prices. Conversely, when world grain supplies are reduced, U.S. policies encourage use of reserve stocks to fill the supply gap caused by reduced foreign crops, as in 1987-88. With the recent changes in U.S. views toward price support and reserve policies, the U.S. role as a residual supplier and holder of reserve stocks has diminished somewhat and could continue in the recent pattern in the 1990s.

U.S. Beef, Pork, and Poultry Exports Rise Sharply to Selected Destinations

The major export markets for U.S. beef are Japan and Canada, and more recently Mexico, Korea, Taiwan, and the EC. Japan now accounts for nearly three-fourths of all U.S. beef exports (see Figure 45). The Japanese market for U.S. beef has expanded strongly since the mid-1970s, partly in response to pressures from the U.S. government for Japan to ease its import restrictions. U.S. beef exports to Brazil increased sharply in 1986-87 due to shipments of beef from the U.S. government dairy herd buy-out program, which was designed to curtail surplus milk production. However, U.S. beef exports to that nation dropped sharply in the next two years, after the program was discontinued. On a tonnage basis, total U.S. beef exports now are more than six times as large as in 1977-78, with much of the growth due to increased Japanese purchases.

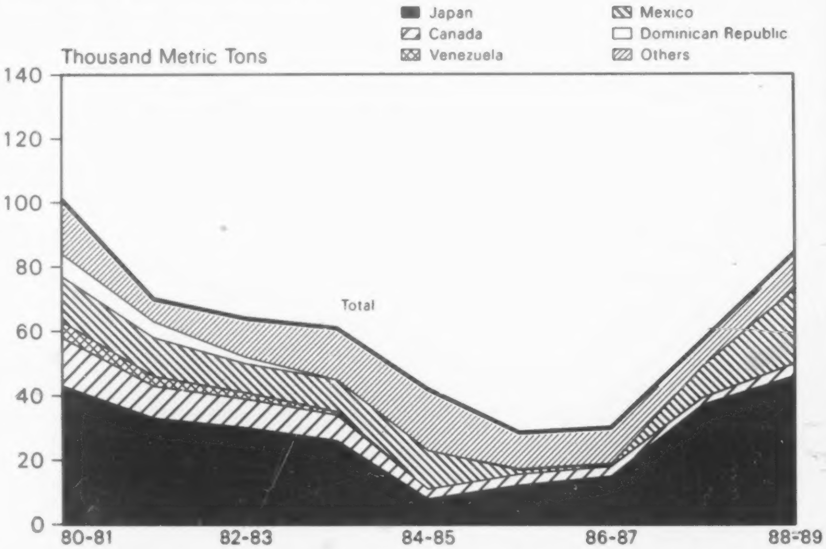
Future growth rates in U.S. beef exports will depend partly on trade negotiations to ease import barriers in Europe and other areas, as well as easing of import barriers already negotiated with Korea and Japan. The U.S. government has been successful in negotiating with Japan and Korea to reduce their beef import barriers, partly because of the large positive trade balance the two nations have with the U.S. While some easing of import restrictions is possible in other countries, major changes probably should not be expected in the near future. Foreign beef producers are extremely sensitive to changes in import policies that would increase supplies and depress prices for their products. And, in several beef importing nations, agricultural producers have substantial political influence. Thus, resistance of foreign producers to easing of trade barriers is likely to continue as a restraining influence on the growth of U.S. beef exports, although further growth appears likely in the years ahead in the Far East.

Major destinations for U.S. pork exports include Japan, Mexico, Caribbean nations, and Canada as shown in Figure 46. Pork exports from the U.S. to Canada were in a major downtrend from the late 1970s until the late 1980s, partly as a result of the strong U.S. dollar relative to the Canadian currency, which discourages U.S. exports. However, the downward trend ended in 1988-89, with a 79 percent increase in quantity and a 48 percent increase in value of U.S. pork exports to its northern neighbor. U.S. pork exports in 1987-88 were only slightly more than half as large as a decade earlier, but the 48 percent increase in total quantity of pork exports in 1988-89 was a welcome change in direction for the U.S. pork industry. The 10-year decline in U.S. pork exports also reflected strong competition from pork exporting nations in Western and Eastern Europe, but competition from those sources has moderated somewhat in the past year. A possible weaker U.S. dollar and world economic growth may help to maintain at least a modest increase in export demand for U.S. pork in the early 1990s, especially in Far East markets.

U.S. exports of edible offals and variety meats remained in a slight upward trend during the late 1970s and 1980s, with the trend continuing through 1988-89 (see Figure 47). Major destinations for exports of these products include Japan, Western Europe, Mexico, Canada, and Egypt. In the last several years, Egypt has emerged as a significant growth market for U.S. edible offals and variety meats. By 1988-89, it accounted for 10 percent of the quantity and 4 percent of the value of all U.S. exports of these products and ranked third in size of purchases, behind Mexico and Japan. In the past two years it has surpassed France and the United Kingdom both in value and in quantity of U.S. imports of variety meats and edible offals. Its quantity of imports of these products in 1988-89 was nearly four times as large as that of France and slightly more than twice as large as the imports by the United Kingdom.

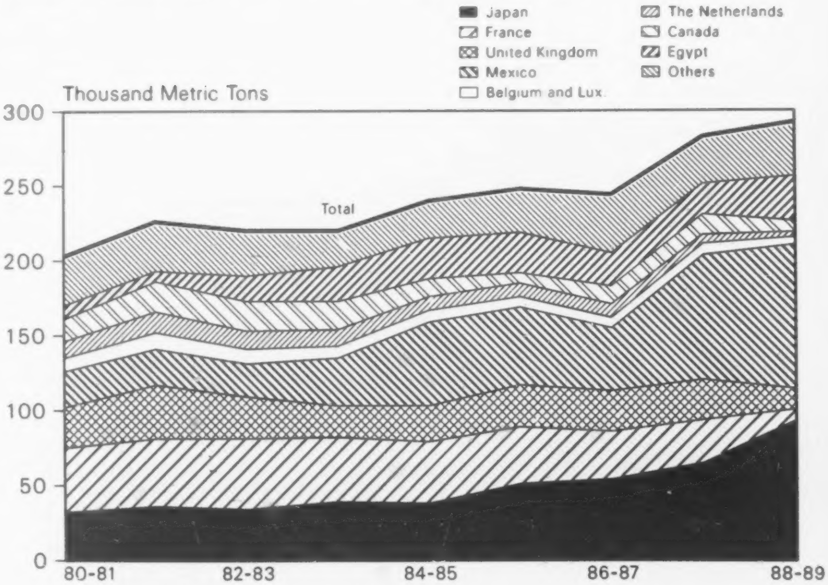
U.S. poultry meat exports were in a sharp downward trend in the early 1980s, as shown in Figure 48. But, exports of these products turned upward in fiscal 1987-88 and 1988-89 to set new records in both years. Declining poultry meat exports in the early 1980s reflected subsidized competition from the EC and Brazil, adverse effects from the strong U.S. dollar from 1981 to 1985, and sluggish world economic growth.

Figure 46. U.S. Pork Exports by Major Destinations, 1980-81 through 1988-89 October-September Fiscal Years.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988; November-December 1989; various other issues.

Figure 47. U.S. Exports of Edible Offals and Variety Meats by Major Destinations, 1980-81 through 1988-89 October-September Fiscal Years.

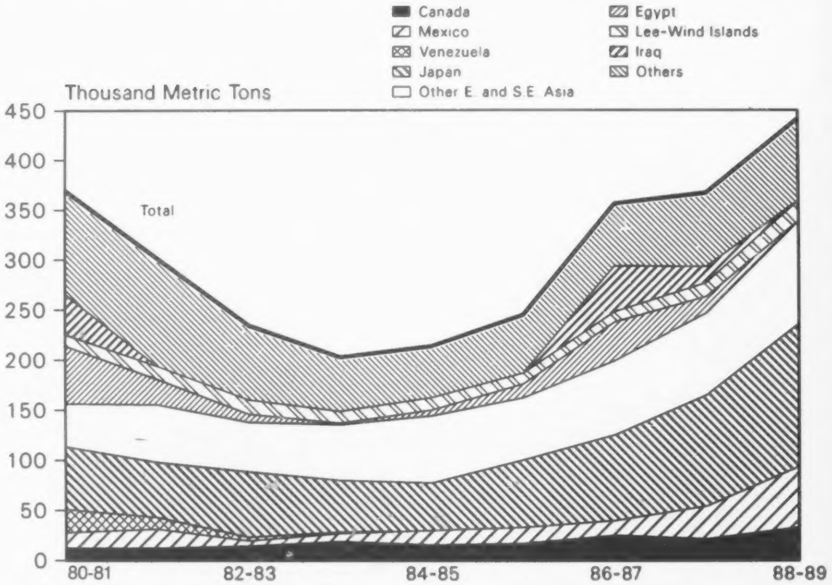


Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988; November-December 1989; various other issues.

Reduced exports to Iraq, Egypt, Mexico, Venezuela, and several countries in the "Others" category in Figure 47 accounted for much of the earlier decline.

As Figure 48 indicates, growth in U.S. poultry meat exports to southeast and eastern Asian markets has been substantial in the last few years. Expanded U.S. poultry meat exports in 1988-89 were concentrated largely in shipments to Japan, Canada, the Caribbean area, and Mexico due to economic growth in these nations. Increased export quantities and slightly higher prices pushed the value of 1988-89 U.S. poultry meat exports 21 percent above a year earlier. The future of U.S. poultry meat exports will depend heavily on the exchange rate of the U.S. dollar and the strength and timing of changes in world economic growth.

Figure 48. U.S. Fresh and Frozen Chicken and Turkey Exports by Major Destinations, 1980-81 through 1988-89 October-September Fiscal Years.



Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, Fiscal Year 1987 Supplement; November-December 1988; November-December 1989; various other issues.

U.S. Price and Income Support Levels Decline Again 1990, but Future Depends on New Legislation[45]

U.S. price and income support levels for major crops continued to decline in 1989 and 1990, in response to administrative authority provided in U.S. farm laws that are scheduled to expire at the end of the 1990-91 marketing year. The expiring support mechanisms grew out of a six-month congressional debate in 1985 on ways to improve the U.S. agricultural position in world markets. The resulting legislation allowed sharply lower price support levels on major crops beginning in 1986, with additional declines in government price support levels permitted through 1990 at the discretion of the U.S. Secretary of Agriculture. The legislation, known as the Food Security Act of 1985, continued a two-fold approach for income support to U.S. producers of major crops. Target prices have been a key element of this support system. They are used to determine the amount of deficiency payments or direct payments to farmers participating in acreage reduction programs if market prices during a specified time period are below target levels. Target prices for major U.S. crops were frozen at 1984-85 levels ($3.03 per bushel for corn, $4.38 for wheat) through the 1987-88 marketing year, and then were moderately reduced through the 1990-91 marketing year, ($2.75 per bushel for corn on the 1990 crop, $4.00 for wheat on the 1990 crop). Deficiency payments based on these target prices are available only to farmers who participate in U.S. government land-idling programs and meet appropriate conservation requirements on the land removed from production. Thus, part or all of the deficiency payment may be viewed as a compensation for withdrawing land from production. There is a target price for wheat, corn, oats, barley, sorghum, cotton, and rice, but not for soybeans or sunflower seed.

The other major component of the U.S. price support system is the loan rate mechanism. The price support loan program dates back to U.S. price support systems that originated in the depression years of the 1930s. Farmers participating in government land-idling programs (except for soybeans, where no land-idling programs have been in effect) may store their crops beyond harvest and receive a government loan at the designated loan rate per bushel. These loans have a nine-month maturity. At any time during this period, the farmer may repay the loan plus accumulated interest and sell or use the grain. An alternative often used when cash prices are below the loan rate is for the farmer to deliver the grain (or other crops) to the government in fulfillment of the loan. In this case, principal and interest on the loan need not be repaid. This process is known as forfeiture of price support loans. It is the primary means of increasing grain stocks owned by the Commodity Credit Corporation (CCC), an agency of the U.S. government. Loan rates vary from county to county across the U.S., due to differences in transportation costs from local producing areas to major export markets. There are thousands of counties in the U.S., each of which has a local office to administer the price support program. For example, Iowa—the leading corn producing state in the U.S.—has 99 counties and corn loan rates that vary by approximately $.18 to $.19 per bushel ($7.09 to $7.49 per metric ton) from the highest to the lowest level. The loan rates often have served as a base on the U.S. season average price.

Corn Loan Rates Down

The Food Security Act of 1985 provided much more discretionary authority to the Secretary of Agriculture in setting crop loan rates than in the past. For example, the 1990 crop U.S. average loan rate for corn was set at a statutory minimum level of $1.96 per bushel, down from $2.55 on the 1985 crop. However, the agriculture secretary was permitted to reduce the statutory level as much as 20 percent to maintain competitiveness in world markets. The maximum allowable downward adjustment was made for the 1986 through 1990 corn loan rates. As a result, the effective 1990 national average corn loan rate is $1.57 per bushel, down $.98 per bushel ($38.61 per metric ton), or 38 percent, from the 1985 crop loan rate. The loan rates for 1991 and later crops will depend on 1990 legislation, which is being developed at this writing. Effective loan rates in the next few years also could be reduced by undetermined amounts resulting from the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Reduction Act. Loan rate formulas from the 1985 legislation allowed flexibility in U.S. export prices in order to meet foreign export competition.

These policy tools are likely to be continued with modest adjustments in the next few years. They are a signal that the U.S. Congress and U.S. administrations are serious about maintaining increased competitiveness of U.S. agricultural exports. Recent U.S. price support programs are a substantial departure from pre-1985 policies, which supported world prices and encouraged foreign exporters to price their products slightly below U.S. support levels, if necessary, to clear the market and avoid increased carryover stocks. They reflect a U.S. desire for other exporting nations to share the burden of matching global market-available supplies with effective demand. Failure of other countries to do so could result in a penalty in the form of depressed prices and reduced incomes to their respective agricultural sectors.

Loan Rates for Other Crops Also Lowered

Loan rates for other grains are established through formulas similar to those for corn. For example, the nominal U.S. average loan rate for 1990 crop wheat was reduced to $1.95 per bushel ($71.66 per metric ton), down $1.35 per bushel from the 1985 level.[46]

The 1986 through 1989 average soybean loan rates were lowered to $4.77 per bushel ($175.30 per metric ton), from $5.02 in 1985. For 1990 crops, the soybean loan rate is scheduled to be 75 percent of the immediately preceding five-year average price received by farmers, excluding the high and low years, with a $4.50 per bushel minimum level and a constraint that the loan rate may not be reduced more than 5 percent from the previous year.[47]

Deficiency Payments

While loan rates are the main price support mechanism in U.S. farm programs, income support for producers of most major crops is linked more directly to target prices. For 1990 crop corn, producers participating in the government acreage control program will be eligible for deficiency payments to make up some or all of the difference between the target price and the market price if prices received by farmers are below the target price. Maximum deficiency payments for this year's corn crop will be $1.18 per bushel, the difference between the loan rate of $1.57 per bushel and the target price of $2.75. If season average market price is above the loan rate, as seems likely, participating farmers will be paid only the difference between the market price and the target price. Participating farmers receive deficiency payments on normal production on area planted. In addition, the first $.79 per bushel of the corn deficiency payment—$2.75 target price ($108.28 per metric ton) minus $1.96 statutory loan—is subject to a $50,000 payment limit per farmer to avoid unduly large benefits to large farms. Payments are available only to farmers who idle at least 10 percent of their historical corn area; thus, the payments are both an income support and a payment for idling land.

For wheat, the target price of $4.00 per bushel for the 1990 crop provides maximum wheat deficiency payments of $2.05 per bushel ($75.34 per metric ton). As with corn and other feed grains, a $50,000 payment limitation per farmer applies with some exceptions. U.S. soybeans have no target prices and consequently no direct government payments are available for their production.[48] Although there has been no direct land-idling program for soybeans in the entire history of U.S. government supply-control programs, the nation's soybean area has been reduced by the long-term Conservation Reserve Program and has been affected indirectly by land-idling programs for other crops.

Supply Control Provisions

For more than half a century, the U.S. has taken primary responsibility for supply management in world grain markets in times of surplus production. The Food Security Act of 1985 provided for a continuation of that role if sharply lower price support levels fail to generate enough additional domestic and export demand to balance supplies and utilization with a realistic level of U.S. grain carryover stocks. For corn and other feed grains (coarse grains), producers were required to idle from 12.5 to 20 percent of their feed grain base acreage to obtain program benefits, if U.S. old-crop corn carryover stocks were more than 2 billion bushels (50.8 million metric tons). If carryover stocks were at or below 2 billion bushels, no more than 12.5 percent of an individual farm's feed grain base area would need to be idled to qualify for program benefits. For wheat, land-idling requirements for participation ranged from 15 to 30 percent of a producer's base area when old-crop U.S. wheat carryover stocks exceeded 1 billion bushels (27.2 million metric tons). Maximum land-idling requirements were 15 percent of the base when carryover stocks dropped to or below 1 billion bushels. U.S. soybeans continue to have no land-idling provisions. These supply-control provisions are almost certain to be continued in modified form in 1990 U.S. agricultural legislation.

In addition to land-idling features in individual commodity programs, the Food Security Act of 1985 established a long-term program that is required to idle up to 40 to 45 million acres (16.2 to 18.2 million hectares) of erosion-prone cropland for 10 years. The land-idling goal was intended to be reached by 1990 but may not be attained until 1991 or 1992. It would represent 11 to 12 percent of all U.S. cropland. Land idled under this program must be planted to trees or grass. Mechanical harvesting of these products is forbidden during the life of the contract unless temporarily authorized under emergency drought relief measures. In return for removing the land from production, land owners receive an annual rental payment that must not exceed the prevailing commercial rental rate for comparable cropland in the area where the producer is located. Land being idled under this program is well below average in productivity, because it represents steeper-sloping fields and land in less humid areas that is subject to wind erosion. A sizable part of the land idled under the long-term program came from wheat, other small grains, and soybean production. Through late spring of 1989, U.S. farmers had enrolled 30.6 million acres (12.4 million hectares) in this program. By 1996, land will begin to be released from the Conservation Reserve Program as the 10-year contracts expire. The 1985 farm act also contains "sodbuster" and "swampbuster" provisions, which make farmers bringing such land into production ineligible for any U.S. government program benefits.

Grain Reserve Programs

In the first half of the 1980s, the Farmer-Owned Grain Reserve Program was a key supply management tool in U.S. farm policies. When supplies exceeded market demand, farmers were paid to continue storing grain for three to eight years and were permitted to sell the grain only if prices rose sharply or if the grain was deteriorating in quality. The reserve program remains in effect through at least 1990-91 and is likely to be extended for future years with some modifications. Future quantities held in the reserve will depend on the ability of U.S. production to exceed market demand. Pre-1990 U.S. legislation placed upper and lower limits on the amount of grain in the reserve. For wheat, the normal upper limit was 30 percent of estimated total annual domestic and export usage. The lower limit was 300 million bushels (8.2 million metric tons). The normal upper limit on feed grain reserve stocks has been 15 percent of total annual domestic usage. The minimum desired feed grain reserve was 450 million bushels (11.4 million metric tons). Higher reserves equal to 110 percent of these maximum levels could be established at the secretary's discretion.

Maximum limits on reserve stocks became effective in the 1986-87 marketing year and prevented entry of 1986 and 1987 crops into the reserve.

Implications for U.S. and World Agriculture

U.S. agricultural policy in the last half decade has reflected the growing internationalization of the nation's farm and agribusiness sectors, and their heavy dependence on exports for market growth and financial stability. As new U.S. farm legislation is being developed in mid-1990, a similar direction seems likely for U.S. agricultural policy in the next few years. These policies represent a shift in U.S. price support programs in the direction of the EC support system, with domestic crop incomes supported well above world levels through the target price system. However, one important difference from the EC grain price support system is that U.S. farmers generally are required to idle a substantial part of their cropland to qualify for price and income supports. The only exception is where carryover stocks are projected to drop to relatively low levels. The policy changes initiated in 1986 have exerted sharp downward pressure on U.S. and world grain and oilseed prices from levels of the late 1970s and early 1980s. Low U.S. price supports should reduce incentives for increased corn and wheat production in other exporting nations, and are encouraging increased grain utilization by making livestock and poultry products affordable to a larger segment of the developing world. These developments along with severe drought in Asia in 1987 and in North America in 1988 have moved global grain production and utilization toward equilibrium levels. But if weather improves, future U.S. and world coarse grain stocks could increase at least modestly from current low levels.

Reduced U.S. price support levels in the late 1980s cut grain prices received by farmers in such exporting nations as Canada, Argentina, Brazil, Australia, South Africa, and Thailand from levels of earlier years. In the EC, and some parts of Japanese agriculture where domestic policies support prices well above world levels, government expenditures for farm programs have tended to insulate farm sector incomes from the downward pressure on world grain prices. Political pressure in the EC is shifting toward lower agricultural price supports and small scale cropland idling programs. In importing nations, lower prices are advantageous for domestic consumers in the short run, but work against incentives for increased self-sufficiency in agricultural products in the longer run. In addition, the lower level of world prices from time to time has increased temptations for the U.S. and other nations to follow protectionists trade practices such as import restrictions to shield domestic producers from foreign competition. For example, in 1987 Canada implemented an import tax on U.S. corn to protect Canadian corn producers.

In the struggle to expand agricultural export shares, a trade subsidy war has been waged by the U.S. and the EC. Export subsidies have been used heavily on wheat and barley and, to a lesser extent, on sorghum and vegetable oils from 1987 through mid-1990. In some instances the export subsidies reduced the cost of the product to foreign buyers by one-fourth or more from world market price levels. But, with the record decline in U.S. wheat carryover stocks from 1988 through 1990, U.S. export subsidies could be used less aggressively in the next few years.

U.S.-European Community Trade Tensions Continue[48]

U.S.-EC trade tensions continued through the past year, and are likely to remain an important element in world agricultural trade until at least the completion of the Uruguay Round of GATT negotiations. These tensions developed during the 1980s as the EC shifted from being the largest U.S. export market for grains to a position as one of its largest competitors in a number of farm products. Or adding to the tension from the U.S. side has been the sharp downward trend in U.S. exports of soybeans and meal to the EC in the last several years, heavily subsidized EC grain exports, and what many in the U.S. view as failure of the EC to seriously share in the role of balancing global supplies with global demand for agricultural products. In fact, a case can be made that the EC agricultural support system by insulating its farmers from fluctuations in world prices, amplifies the instability of agriculture in the U.S. When world supplies of grain are short, EC users are isolated to a large extent from price signals encouraging reduced utilization, thus causing more of the market rationing job to be done in the U.S. Other developments contributing to trade tension were continuing large excess grain supplies in the EC, the EC's shift to exports of maize (corn) to third world countries, a threatened EC tax on vegetable oils, sharply expanded EC oilseed production (noted in the oilseeds section of this report), and a continued large U.S. nonagricultural trade deficit with EC nations.

These tensions led to a U.S. appeal to a GATT panel regarding the acceptability of EC oilseed policies under GATT regulations. The outcome of the review was that the EC was found to be in violation of GATT rules and will need to make changes in such policies in the years ahead. In 1989, U.S. sugar policies also were found to be in violation of GATT rules. These policies are expected to be dealt with in 1990 U.S. farm legislation, which was still being developed at this writing.

U.S.-EC trade tensions from the European viewpoint were due in part to aggressive U.S. use of export subsidies on wheat and barley in important EC markets. Other contributors to trade tensions, as seen by EC, included large U.S. exports of corn gluten feed and meal to the EC as by-products of an industry that EC views as being heavily subsidized through tax concessions, and what EC sees as an unrealistic GATT negotiating stance calling for removal of all trade-distortion policies from global agriculture. These tensions likely are continuing to place a downward bias on world wheat and barley prices relative to those that would exist in a less tense trade environment. As noted in previous issues of this report, price impacts from the tensions have worked to the disadvantage of grain farmers in exporting nations such as Canada, Argentina, and Australia, where producers receive minimal government price and income protection. They have worked to the advantage of foreign grain buyers, and to the disadvantage of taxpayers, especially in the U.S. and less so in the EC, according to one analysis.[49]

A potential source of U.S.-EC tensions in 1991-92 will be the scheduled expiration of the U.S.-EC maize and coarse grain agreement. This four-year agreement, reached in February 1987, was to partially protect the U.S. against adverse effects from the entrance of Spain and Portugal into the EC. It includes EC commitments to allow 2 million metric tons of corn (maize) and 0.3 million metric tons of sorghum to be imported into Spain annually under reduced levies, and eliminates Portugal's requirement to purchase 15 percent of its coarse grain import needs from other EC nations.[50] The agreement also extended the EC's zero duty on corn gluten feed and soybean meal to Spain and Portugal. But Spanish imports of grain substitutes such as corn gluten feed, distillers, dried grains, and citrus pellets can be counted toward its allowed quantity of coarse grain imports.[51] Spain's and Portugal's imports of grain substitutes are likely to increase considerably in the years ahead because of their zero import duty status and absence of import levies. The agreement does not provide guaranteed access of U.S. grain to Spain and Portugal, since other non-EC countries can compete for that market. Moreover, it does not prohibit the EC from exporting an equal volume of its own coarse grain and wheat to offset required non-EC imports into Spain and Portugal. Thus, the February 1987 agreement has not been a permanent solution to U.S.-EC trade tension stemming from the admission of Spain and Portugal to the EC. Its expiration may bring renewed tensions over possible loss of U.S. exports to these two EC member nations.

Longer-Term Trade Prospects: Modest Expansion Indicated

With major changes in U.S. agricultural policy that have been in effect since mid-1986, a key question for both the production agriculture and agribusiness sectors is: Will the recent recovery in the U.S. share of world agricultural trade be maintained and expanded in the next several years? To answer this question, a research group at Iowa State University and the University of Missouri have developed on-going, long-range economic forecasts of U.S. and world trade in major agricultural commodities.[52] These forecasts are based on the assumptions of no major weather disasters or political upheavals, no major business recession, and no major alterations of U.S. agricultural policies from those prescribed by the U.S. Food Security Act of 1985.

According to the forecasts, recent trends in world agriculture will continue and consumption of major grains will gradually increase into the late 1990s. Area planted to grains is expected to increase slightly in several major grain exporting nations, along with a moderate increase in the U.S. in the last part of the period as government land-idling incentives are reduced. Yields both in U.S. and non-U.S. producing areas are forecast to increase modestly through the late-1990s and to meet the anticipated growth in world consumption. India is projected to remain a small net importer of wheat after a brief period of being a net exporter from 1985 through mid-1988, although the magnitude of its imports is projected to decline through the late 1990s. Chinese wheat imports are projected to remain in the 11 to 14 million ton per year range, with growing domestic demand absorbing all expected increases in Chinese production. Soviet wheat and feed grain imports each are projected to remain in the 15 to 17 million ton range, about the same as in 1988-89. Its grain production is expected to remain below growing domestic demand, despite efforts to reform the Soviet agricultural sector. The EC coarse grain exports are expected to stabilize at 6 to 7 million tons, down 2 to 3 million tons from the record 1988-89 level.

After substantial growth in U.S. wheat and coarse grain exports during the past four years, U.S. exports are forecast to decline slightly in the early 1990s before rising again in the 1991-97 period. The projected temporary decline in U.S. exports early in the decade is due to an anticipated recovery of foreign crops from recent major weather problems. Average U.S. coarse grain exports for 1993-97 are projected to be about 29 percent above the 1989-90 level but 3 percent below the 1979-80 record of 71 million metric tons. Average U.S. wheat exports in 1993-97 are projected to be about 7 percent below the record level of 48.2 million metric tons reached in 1981-82. Soybean exports from the U.S. are projected to expand, but remain 16 percent below the 1981-82 record in 1993-97 because of increased oilseed production in Western Europe, South America, and other areas. However, average 1993-97 U.S. soybean meal exports are projected to be about one-tenth above the previous record in 1986-87. U.S. soybean oil exports toward the end of the period are expected to about match the 1981-82 record.

Growth in exports, increased U.S. domestic processing and grain feeding, and government programs to hold cropland out of production are projected to hold U.S. carryover stocks of coarse grains and wheat throughout the period at about one-third of the peak 1986-87 level. U.S. soybean carryover stocks are projected to remain near current levels in the early 1990s, and then increase slightly in the 1993-97 period. Corn prices received by U.S. farmers are forecast to trend slightly upward into the late 1990s. The undeflated average price received by U.S. farmers for corn is projected to range from $2.09 to $2.31 per bushel ($82.29-$90.96 per metric ton) from 1990-91 through 1996-97. Nominal prices at that level would be about 8 to 16 percent lower than in 1988-89. Projected wheat prices follow a similar but more variable pattern, with $3.01 to $3.57 yearly average farm prices per bushel ($110.62-$131.20 per metric ton) from 1990-91 through 1996-97. Prices in this range would be 4 to 19 percent below 1988-89 average farm prices. Cotton carryover stocks are expected to trend moderately downward during the forecast period, with 1993-97 average U.S. stocks about two-thirds as large as in 1989-90. Prices for soybeans and cotton are forecast to trend modestly upward in the 1990s. U.S. exports of beef are projected to trend upward into the mid-1990s, but at a considerably slower rate than in the 1987-90 period. U.S. pork exports are projected to stabilize near recent levels in the 1990s. U.S. exports of broilers are projected to follow an upward trend in the decade ahead at an average annual growth rate of around 3 percent.

These forecasts of U.S. and world exports of major crops are summarized in Table 21. In general, they indicate a gradual diminishing of excess production capacity in U.S. agriculture into the late 1990s. The excess capacity will be restrained by the government long-term land-idling program. At the same time, total costs of U.S. farm income support and export subsidy programs are expected to remain at less than half the peak levels of the mid-1980s and to fluctuate within an $8 to $13 billion range, with a downward trend from 1992-1997. Part of the cost of balancing global production and utilization has been transferred to other nations through lower U.S. price support levels and a greatly reduced willingness of the U.S. to support world crop prices. These transfers have occurred in the form of farm program costs in the EC and other nations protecting domestic agriculture from import competition, and restrained farm incomes and asset values in areas such as Canada, Australia, and parts of Latin America where government farm income support programs traditionally have been limited. Shifting these costs abroad tends to reduce incentives to increase food self-sufficiency in developing nations that have chronic food shortages.

These forecasts outline the general path of the U.S. agricultural sector and world trade patterns that can be expected with no major external shocks and a continuation of the recent direction in U.S. agricultural policies. At this writing (mid-1990), support for continuation of recent U.S. policies appears to be emerging, with modifications to deal with special problems relating to crops such as sugar, oats, and soybeans. U.S. agricultural policies have been an important factor behind a downward trend in area of these crops grown in the U.S. and a resulting loss of U.S. shares of global oat and soybean trade. Expected measures to deal with these aspects of U.S. agriculture include adjustments in relationships of target prices among crops, modifying government loan programs and adding farm program features that provide greater flexibility to producers in allocating crop land among various crops.[53]

Along with agricultural policy variables, weather patterns will exert a strong influence on future production, utilization, exports, and carryover stocks of major U.S. farm commodities. Historically, the long-term upward trend in U.S. crop yields and supplies of major crops has tended to be interrupted by widespread weather problems during one to three years each decade. The timing and intensity of such problems usually are considered random events. These problems can temporarily deflect the agricultural sector from its longer-term path. Weather variations in the 1990s may well cause temporary deviations from the predicted general long-term pattern of the U.S. agricultural economy. Widespread and severe weather problems in the U.S. coupled with the current low U.S. and global grain carryover stocks would be likely to trigger a substantial short-term decline in U.S. exports from the levels shown here as well as a sharp reduction in grain and oilseed meal feeding in the U.S. livestock-poultry sector. With low stocks, the declines could be significantly larger than the U.S. has experienced in previous years.

Researchers disagree on the randomness or regularity of weather patterns in major world grain producing areas. However, one analysis of North American weather patterns has identified evidence of a long standing drought cycle affecting the U.S. grain belt at approximately 18.5 year intervals. This research indicates a period of adverse U.S. weather is possible in the early 1990s.[54] The increased vulnerability of U.S. exports to major weather problems may lead to a reappraisal of the nation's grain inventory policies. Policies that might be re-evaluated include: (1) the minimum size of needed reserve stocks, (2) mechanisms for acquiring U.S. government grain inventories, and (3) procedures for releasing those stocks into market channels when commercially owned supplies decline sharply.

Table 21. U.S. and World Net Export Forecasts for Wheat, Coarse Grains, Soybeans, and Soybean Meal in 1990-91, 1991-92, 1992-93, and 1993-97 Average, and Comparisons with 1988-89 in Millions of Metric Tons.

Commodity	Prelim. 1988-89	Forecast 1990-91	Forecast 1991-92	Forecast 1992-93	Forecast 1993-97 Ave.
World wheat	97.00	88.91	90.86	93.88	100.88
U.S. wheat	37.80	37.54	38.22	40.37	44.81
Non-U.S. wheat	59.20	51.37	52.64	53.51	56.07
U.S., percent of total	38.97	42.22	42.06	43.00	44.42
World coarse grains	94.50	80.09	83.50	87.83	101.20
U.S. coarse grains	61.30	51.38	52.92	56.29	68.61
Non-U.S. coarse grains	33.20	28.70	30.57	31.54	32.58
U.S., percent of total	64.87	64.16	63.38	64.09	67.80
World soybeans	23.51	26.35	26.81	27.10	29.09
U.S. soybeans	14.35	17.90	18.38	18.69	21.19
Non-U.S. soybeans	9.16	8.45	8.43	8.41	7.90
U.S., percent of total	61.04	67.94	68.60	68.95	72.84
World soybean meal	25.50	21.89	22.47	23.38	25.93
U.S. soybean meal	4.66	5.04	5.44	6.02	7.48
Non-U.S. soybean meal	20.84	16.85	17.03	17.36	18.45
U.S., percent of total	18.27	23.02	24.22	25.75	28.86

Source: Forecasts are from FAPRI *U.S. and World Agricultural Outlook*, Food and Agricultural Policy Research Institute, Iowa State University (Ames, Iowa), and University of Missouri (Columbia, Mo.), April 1989. The 1988-89 data are from the U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oilseed Situation and Market Highlights*, FOP 5-90, May 1990; and U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG4-90, April 1990.

GATT Negotiations Continue Slow Progress

The eighth round of the General Agreement on Tariffs and Trade (GATT) Multilateral Trade Negotiations (MTN) began with an early 1987 meeting in Uruguay. The negotiations have been scheduled to end in late 1990, although at this writing (mid-1990), slow progress casts some doubt on the exact completion date. A total of 97 nations, which accounts for about 90 percent of the world's trade, has been participating in the negotiations along with USSR as an observer in the latter stages of the discussions.[55] Previous GATT negotiations focused more on nonagricultural trade issues and encouraged a decline in tariffs on manufactured goods from an average of 40 percent in the 1960s to 4 to 6 percent in the 1980s[56] Widespread concern about protectionism, increased subsidies in agricultural trade, and depressed farm incomes prompted participating nations to focus on more agricultural trade issues. These negotiations are an effort by major industrial and agricultural trading nations to agree to reduce import restrictions and subsidies on exports of raw and processed farm products. If successful, the outcome will have important implications for agricultural producers, consumers, and policy makers throughout the world.

GATT and Its Origins[57]

GATT originated during a series of meetings in 1946 and 1947 at which the International Monetary Fund (IMF) and a fixed system of currency exchange rates were established after World War II. At that time the U.S. proposed three organizations for dealing with international financing and trade problems: the IMF, the World Bank, and the International Trade Organization. The proposed International Trade Organization would have been assigned the tasks of promoting trade liberalization and enforcing trade policy agreements. The first two organizations were approved, but the U.S. Congress vetoed the International Trade Organization because it was unwilling to transfer domestic policy-making power to an international organization. In its place, GATT was established to encourage trade liberalization. However, GATT was not given enforcement powers. GATT is a set of trading rights and obligations voluntarily agreed to by a group of member nations. To compensate for the absence of enforcement powers, other member nations have the ability to withdraw concessions from a GATT member that has violated trading rules.[58] GATT specifies rules and guidelines for international trade, provides a forum for discussion of trade problems, and includes provisions for formally challenging other members' trading practices and policies.

An indication of the importance of these procedures to agriculture and an important background element to the current round's emphasis on agriculture is the fact that more than half of the cases of trade practices that were challenged by the U.S. in late 1985 involved agricultural products, with most relating to the EC, Japan, and Canada.[59]

The U.S. had a major influence in the origin and the development of the purposes for GATT. From the start, GATT rules provided special treatment for agricultural imports and exports. For example, GATT provisions include four articles dealing with quantitative restrictions on imports of agricultural products. Article XI prohibits the use of quotas (with certain exceptions) and Article XII provides an exception in the use of quotas for balance of payment reasons. Article XIII outlines rules where other exceptions are applied and quotas may be used. Article XIV provides additional exceptions to Article XIII in cases of certain balance of payment situations.[60] In Article XVI 1 of original GATT rules, subsidies on exports were permitted, but nations were required to report them. In 1955, rules were modified to prohibit nations from using subsidies on primary products to obtain more than an equitable share of world trade in the product or products in question. Regulations at that time were extended to prohibit subsidies on nonprimary product exports, thus bringing a distinction between farm and nonfarm products. Unsuccessful efforts to clarify these regulations were made during the 1979 Tokyo Round of GATT negotiations.[61]

Because of its prominence as an agricultural producer and its strong post-war political position, in 1955 the U.S. was able to obtain a waiver of GATT regulations. The waiver allowed the U.S. to impose quantitive restrictions on agricultural imports under Section 22 of the U.S. Agricultural Adjustment Act.[62] The Section 22 waiver permits the U.S. to implement import quotas if imports into the U.S. threaten its ability to manage certain domestic commodity programs. U.S. efforts also were a major factor in obtaining rules that excluded agriculture from prohibitions on export subsidies. When these exceptions were obtained, they were contrary to the purposes of GATT but did not cause major concern in a world where agricultural trade was much smaller than it is today and where only a few net agricultural exporting nations existed.

World agricultural trade in farm products is vastly different than in the post-war decade and these special exclusions are now causing problems for the U.S. and many of its trading partners. In the late 1940s and 1950s, U.S. agriculture depended only slightly on exports as a source of income and a means of utilizing its production capacity. Few other major agricultural exporters existed, so resistance to allowing agricultural export subsidies and U.S. import quotas was limited. Concerns about these provisions also were relatively minor during the 1970s, because world import demand for farm products was growing rapidy and several nations shifted from a net export to a net import position.

But, the 1980s brought large agricultural surpluses, relatively low world prices, shifts of several nations from grain importers to exporters, an agricultural trade subsidy war between the U.S. and the EC, and growing protectionism. These developments indicate a strong need to reconsider GATT regulations relating to agriculture. A multinational approach such as the GATT negotiations is needed to bring an end to the current trade subsidy war and other trade tensions. If one participant attempted to halt the subsidy war unilaterally, that nation would face a high risk that its export market share would decline sharply as competing countries keep their subsidies in place.[63]

The broad objectives of the 1987 Uruguay round of GATT negotiations are: (1) to improve market access through reduced import barriers, (2) to increase discipline in the use of trade subsidies, and reduce their adverse effects, and (3) to deal with the underlying causes of trade subsidies.[64]

Requirements for Effective GATT Negotiations

Protection of domestic agricultural sectors is a major factor in current international trade policy issues. For example, the EC protects its grain producers with a complex system of price supports that holds domestic prices sharply above the world market price and includes large variable imports levies or duties that discourage imports. A major objective of EC farm policy has been to provide self-sufficiency in farm products, and to avoid a repeat of major food shortages that occurred during and immediately after World War II. That objective has been attained, and the EC is now one of the world's largest agricultural exporters. Its policy objectives also include efforts to maintain a large number of relatively small farms, for social, political and economic reasons.[65]

The U.S. has highly protective policies relating to its sugar and dairy industries, including import controls and support prices well above world market prices. It also has moderate import duties on vegetable oils and restrictions on meat imports. Recent GATT rulings declared that U.S. sugar policies violate that organization's rules. The U.S. has a system of deficiency payments to protect crop producers if world prices fall below specific target prices.[66] These crop payments are different than domestic price support systems in other nations, because U.S. producers currently are required to idle a significant part of their cropland to qualify for the price supports. In addition, the U.S. subsidizes its alcohol fuels industry through motor fuel tax exemptions for alcohol fuels. In a sense, these tax exemptions protect the industry and subsidize exports of by-product feeds produced in the manufacturing of alcohol fuels.[67]

Brazil and Argentina tax exports of processed soybean products differently than exports of raw soybeans to encourage domestic processing of soybeans and exports of value-added products. EC policies also are designed to favor imports of oilseeds for processing over imports of processed products. EC policies encourage domestic oilseed production by supporting prices at levels well above world market prices. Japan allows no imports of rice and has very high support prices for domestically produced rice and other grains to ensure a minimal level of food self-sufficiency. The Japanese consider a minimal level of production essential for national security in a nation already heavily dependent on foreign food supplies and with a very limited domestic cropland base. Japan also has restrictions on meat imports, quotas on imports of corn for industrial processing, and restrictions preventing livestock and poultry producers from buying unprocessed imported corn or sorghum and grinding and mixing it with other feed ingredients on their farms.[68] However, Japan has agreed to reduce and eventually eliminate quotas on beef and certain other agricultural imports.

These are only a few examples of numerous major restrictions on agricultural trade that exist around the world. For the GATT negotiations to be fully effective in liberalizing agricultural trade policies, major participating nations need to be willing to negotiate their domestic farm policies in an international setting. Final approval of the end results of GATT negotiations will be up to legislative bodies of individual countries.[69] Domestic policies of the U.S., the EC, Japan, and other nations stem from unique social, cultural, historical, geographic, and economic conditions, and national values. Because of these factors, the U.S. Congress may be reluctant to completely negotiate away the U.S. target price sytem for grains or the basic system of sugar and dairy import restrictions and price support programs unless it perceives other aspects of the negotiations will be of substantial benefit to U.S. agriculture. For similar reasons, the EC may be reluctant to completely eliminate its variable levy pricing system on grain imports, even over a period of 10 years. There also is doubt about Japan's willingness to eliminate all rice import restrictions, greatly reducing its self-sufficiency in what historically has been its most basic food. That would increase its vulnerability to food trade disruptions resulting from war, labor strikes, political embargoes, or other unpredictable events. The end result of the current GATT round thus could be a reduction but not complete elimination of trade-distorting agricultural policies.

GATT Positions[70]

As of mid-1990, three main GATT negotiating positions have emerged; those of (1) the U.S., (2) the Cairns group, and (3) Japan-EC. The U.S. position was put forth in mid-1987 and modified in 1989 as key issues and areas of concern were being developed. It calls for a gradual elimination of all trade-distorting agricultural subsidies globally. The target date for complete elimination of subsidies and other practices that affect trade in farm products is the year 2,000.[71] Its proposal was modified in 1989 to include conversion of existing nontariff trade barriers to tariffs, with this to be followed by a gradual elimination of the tariffs.

Other details of the revised mid-1990 U.S. position included (1) allowing no new increases in tariffs, (2) providing "snap back" tariff provisions during a transition period if a country's imports surge upward, (3) phasing out export subsidies over a five year period, (4) allowing bona fide food aid exports to continue if they fall within specific rules, and (5) phasing out differential raw and processed product export taxes over five years. The "snap-back" tariff provisions to protect against surging imports would be similar to those contained in the U.S.-Canadian free trade agreement. Differential export (or import) taxes are used to encourage exports of value-added products (imports of raw products for processing), and are a component of trade policy in the EC, Brazil, and Argentina that has worked to the detriment of the U.S. soybean processing industry. The U.S. proposal would permit policies with little or no direct effect on trade to continue, including income support programs not linked to production or marketings. It also called for harmonizing food safety and plant and animal health regulations, using scientific standards, and would allow for differential treatment of trade policies of some developing countries.[72]

Numerous groups and analysts have viewed full attainment of the U.S. position as an unrealistic goal because it would require many nations, including the U.S., to conform their agricultural goals and values to those of other nations. However, support in the U.S. for major changes in world trading rules is broad-based and bipartisan. That support was evident in the passage of the 1985 Food Security Act and a major 1988 U.S. trade bill. Direct and indirect costs to the U.S. under current global trading practices were important considerations behind both bills. This support stems from a changing economic climate for agriculture including increased internationalization and dependency on world financial conditions. Restrictive agricultural trade policies have a high cost in many industrialized nations through direct government expenditures and/or added costs to consumers in purchasing agricultural products. As a result, the present economic environment makes major reductions in global agricultural subsidies a more realistic goal than in the past, although major obstacles remain.

One observer notes that those experiencing negative income effects from global elimination of agricultural subsidies would include nearly all agricultural producers in Japan and the EC, as well as certain groups of highly protected producers in the U.S. and other nations. Those receiving potential benefits would include consumers and taxpayers in Japan, the EC, and U.S., and low-cost producers in countries such as Argentina, Australia, Canada, and parts of the U.S.[73] Other benefactors would include consumers and taxpayers in major importing countries. Producers in those nations would tend to experience negative income impacts. This partial listing identifies several politically powerful groups that are strongly opposed to complete elimination of agricultural subsidies.

A recent U.S. Department of Agriculture (USDA) analysis indicates complete elimination of protectionist agricultural policies at the global level would ultimately lead to significantly increased world trade, increased agricultural specialization within individual countries, and an average increase of 22 percent in world prices for agricultural products. Price increases at the world level, according to the study, would be approximately 65 percent for dairy products, 53 percent for sugar, 37 percent for wheat, 26 percent for coarse grains, 21 percent for beef, and 6 percent for oilseeds and oilseed products. Price changes in individual countries, however, could differ substantially from these estimates.[74] For example, EC producers could face a reduction in prices for many of these products due to removal of high internal price support programs. U.S. wheat producers might also see a decline in domestic prices, despite the increased average for world prices that would be due to elimination of the Export Enhancement Program that reduces the export price of U.S. wheat below domestic prices. Similar conditions could face U.S. sugar, feed grain, rice, and dairy producers, although world price changes for oilseeds should be transferred directly into U.S. domestic markets for these crops.

The estimated increase in world prices associated with complete global liberalization of agricultural trade would be more than double the price effect from the 1988 North American drought.[75] However, shock-effects in individual markets would be greatly moderated by phasing in the trade liberalization gradually over a 10 year period. The upward pressure on prices resulting from trade liberalization would be expected to be only partially tempered by the long-term downward trend of agricultural prices. Products with the largest increases in world trade would include sugar, rice, oilseeds and oilseed products, and beef. The USDA analysis indicated global wheat trade likely would decline by 20 percent and coarse grains would drop by 5 percent. U.S. volumes of exports of most of these products except beef and oilseeds and oilseed products also were forecast to decline under trade liberalization. However, declines in U.S. volumes of grains, dairy product, and sugar exports were projected to be offset by increased meat exports and by an increased value of grain exports due to higher world prices and a rise in market value of exports to offset the reduced government export subsidies. Major deteriorations in annual net agricultural trade balances would occur mainly in the European Community (EC), other West European countries, and Japan.[76] The EC would revert back to a net coarse grain importer as it was prior to 1984. China also would become a net coarse grain importer according to the forecasts, while Japan would import fewer feedstuffs and more meat.[77]

In their negotiating positions, the EC and Japan maintain that complete elimination of government subsidies for agriculture is an unrealistic goal. They also note that the goal is not applied to other industries. Proponents of this position believe elimination of subsidies would cause severe market disruptions, but that some reduction in subsidies, trade barriers, and other forms of market distortion is appropriate. The EC position includes considerable emphasis on maintaining proportional shares of world trade. The EC also has put forth a "rebalancing" concept, in which reduced import restrictions on some commodities might be partially offset by increased import restrictions on others. In the EC, application of this concept might reduce impediments to grain imports, but would increase import restrictions for oilseeds and grain substitutes. Japan has insisted that individual countries be permitted to subsidize their producers to ensure food security. The EC and Japanese viewpoints stem from internal food shortages a few decades ago and different societal values relating to the structure of agriculture than those generally held in the U.S.

The Cairns group consists of 14 major agricultural exporting nations that have been affected adversely by the U.S.-EC export subsidy war. It includes Canada, Australia, Argentina, Thailand, Brazil, and several other developing countries. This group traditionally provides little or no subsidies to the majority of its agricultural producers. For several major products, its producers also are in the "low-cost" category and could benefit from fewer restrictions on global trade. This group's position is similar to that of the U.S. It favors removal of import barriers and export subsidies, and other agricultural support programs that affect trade. Agricultural research and extension programs and income support payments not linked to production would be permitted under its proposal.

The remaining Third World nations also have an important stake in the outcome of GATT negotiations. This group has not had a well-organized position in the negotiations. It has a wide variety of concerns ranging from access to export markets to protection of infant agricultural processing industries. These nations also want to encourage growth of domestic agricultural production to increase food security, strengthen local economies, increase the availability of raw materials for processing and export, and provide adequate food supplies for consumers at affordable prices. The developing nations group may feel its members that are heavily dependent on agriculture should be given certain trade concessions not available to more economically developed countries.[78]

With these complex and different national backgrounds, difficult final negotiations should be expected as the Uruguay round comes to a close. Although a four-year timetable was established at the initial meeting in early 1987, some analysts expect a longer negotiation period because previous GATT rounds have lasted much longer. Immediate major restructuring of domestic farm policies of the U.S., Japan, the EC, and other nations probably should not be expected to result from the negotiations. But, a gradual multilateral easing of import restrictions and a gradual reduction in use of export subsidies seems likely.

Grain exporting nations such as Australia, Canada, and Argentina, which have remained outside the U.S.-EC export subsidy war, will be interested in negotiating limits on export subsidies and time schedules for their elimination. Otherwise, nations not currently using trade subsidies could face unpleasant choices of accepting reduced export shares and continued restraints on incomes of their agricultural sectors, joining the subsidy war, or providing large direct government income transfers to soften the impact on their farm sectors. Although the conclusion of GATT negotiations will be difficult and controversial, progress in dealing with current trade-related policy issues is anticipated. The Uruguay round of negotiations may impose some constraints on U.S. agricultural policy, with possible costs to the sugar and dairy sectors, and benefits for producers and handlers of oilseeds and other crops. Impacts on the U.S. livestock sector may include reduced import restrictions along with enhanced opportunities for exports of meat and other value-added products from the livestock industry.

North American Trade Policy Developments

A U.S.-Canadian Free Trade Agreement was signed in early 1989 after extensive negotiations between the two nations. The agreement covers both agricultural and nonagricultural products and is intended to bring greater integration of the already strongly interdependent economies.[79] Initial steps toward implementation of the agreement are now under way, with full implementation scheduled to be accomplished by 1999. The agreement provides temporary safeguards against a damaging surge of imports in either country, while encouraging full development of each country's comparative advantage in its mix of agricultural and industrial products. Agricultural areas covered in the agreement include tariffs, quotas, import licenses, relative price support levels in the two countries, transportation subsidies, packaging, labeling, grading, health and sanitary regulations, and export subsidies. For details on areas covered by the agreement, see the 1989 edition of this report.

Update on U.S.-Canadian Free Trade Agreement

With less than two years' experience with the agreement, it is too early to evaluate its impact on either nation. U.S. imports of Canadian durum wheat increased significantly in 1989, causing concern over resulting economic pressures in that industry. The increased imports reflect a number of developments including drought in the U.S. durum wheat production area, the free-trade agreement, changing relative U.S. and Canadian supplies, and exchange rate developments. Longer-term impacts on specific industries are somewhat clouded, although the agreement appears likely to be beneficial to U.S. fruit, vegetable, wine, beef and poultry industries. Potential longer-term impacts on U.S. pork, vegetable oil, and durum wheat industries, and Canadian fruit and vegetable industries may be less positive.

Possible U.S.-Mexican Free Trade Agreement

The U.S.-Canadian Free Trade Agreement has generated interest in a similar agreement between the U.S. and Mexico. The Mexican government has expressed strong interest in such an agreement. The presidents of both countries have indicated a desire to begin discussions toward an agreement soon after GATT negotiations are finalized.[80] An agreement, if approved, should bring a net improvement in the economic well-being of both trading partners by encouraging each country to specialize in production of those products for which it has the greatest comparative advantage. However, some individual industries in each country will face negative impacts and a need for resource reallocations as a result of import competition stemming from such agreements. In the U.S., concerns have been expressed about potential negative impacts on labor intensive industries such as textiles and fruit and vegetable production. Other critical areas for discussion would include intellectual property rights and capital transfers between the two nations.

Linkages of U.S. Agriculture to Global Trade Policies

The financial condition of U.S. agriculture and related sectors is continuing to improve from the severe deterioration of the mid-1980s, due partially to increased agricultural exports, government payments to producers resulting from 1985 agricultural legislation, and 1988 and 1989 emergency drought-relief legislation. Financial stress in American agriculture and agribusiness in the last few years was evident from an unusually high percentage of U.S. farmers forced out of agriculture through bankruptcy or other means, excess capacity in the U.S. agricultural marketing and transportation system that at times was as high as 25 to 35 percent, severe financial losses, consolidation of firms and operations in the U.S. farm machinery industry, failure of the largest number of U.S. agricultural banks since the 1930s, and a sharp decline in asset values in U.S. agriculture and agribusiness. After experiencing these stresses, financial conditions of the U.S. agricultural sector have improved significantly in the last three years. However, problems remain in parts of the Farm Credit System and among some individual producers and agribusiness firms.

These problems also have been faced by farmers in several other nations. But, until very recently, the seriousness of such problems may have been greater in the U.S. than elsewhere for at least three reasons. First is the traditional role of U.S. farm policy as the adjustment mechanism for balancing world supply and demand. Most other exporting nations do not have a policy of building large carryover stocks when world supplies exceed demand. Instead, their agricultural sectors move excess production into world markets and maintain carryover stocks near normal levels. Long-standing U.S. policies result in much of the world's excess grain production being held in U.S. carryover stocks in years of surplus crops. Thus, when foreign grain supplies are large relative to demand, U.S. exports decline as other nations market their excess production. That makes the U.S. a residual supplier, and its carryover stocks rise when world production is large.[81] Second, this process was accelerated from 1980 to 1985 by the strength of the American dollar, which placed U.S. farm product exports at a competitive disadvantage relative to other exporters. Strength of the U.S. dollar, at several points, was great enough to permit imports of major U.S. farm products such as wheat, soybeans, soybean oil, oats, beef, and pork into the U.S. despite sizable import duties. A strong U.S. dollar encouraged foreign nations to invest in their farm sectors to expand their agricultural production. It also enabled them to market those supplies more easily than would be possible with a weak dollar. While the dollar dropped sharply in value against several industrial nation currencies in the 1986-88 period, it turned strongly upward again in late 1988 and 1989 and has remained quite strong relative to currencies of several other grain exporters and developing nation importers throughout the 1980s. Agricultural investments made when the dollar was stronger have few alternative uses and will continue to be used for agricultural production even with lower farm product prices.

A third factor making U.S. agriculture extremely vulnerable to declines in export demand is its large excess production capacity. In the absence of government supply control programs, domestic demand would absorb only about two-fifths of the normal U.S. wheat production, one-half of the U.S. soybean crop, and two-thirds of the annual U.S. corn production. A healthy and growing export demand thus is critical to U.S. agriculture in utilizing its excess production capacity. Other sectors with a major stake in strong export markets include rural communities across the U.S. and workers and firms in the agricultural input, marketing, finance, and transportation sectors. Nearly one out of every five workers in the U.S. is employed in an agriculturally related job.[82] With the increased physical volume of U.S. agricultural exports, financial conditions in the U.S. agricultural sector have improved but remain less favorable than during the 1970s. Negative impacts on U.S. production agriculture from the sharp decline in exports in the 1981-86 period were tempered by large government payments and government programs to remove land from production. However, demand for agricultural inputs and marketing services declined until mid-1987 as a result of the land-idling programs. Large-scale land-idling programs reduced local employment opportunities and demand for products and services of mainstreet businesses in rural communities. A major uncertainty in future financial prospects for U.S. agriculture is the fact that large costs of U.S. government farm programs and federal budget deficits are generating pressure to reduce farm program expenditures.

With the internationalization of agriculture, trade policies and export trends are vital to the U.S. agricultural sector. Because of its heavy dependence on exports, realistic domestic policies for U.S. agriculture cannot be formulated without recognizing their links to the export sector and the current export environment. With the important role of exports in the financial health of U.S. and world agriculture, there is a strong need for the U.S. and its trading partners to work toward policies that encourage increased agricultural trade.

Exchange Rate Impacts on Agriculture

There is considerable evidence that U.S. agricultural exports and imports respond, with time lags, to changes in the exchange rate of the dollar relative to other currencies. For example, a U.S. Department of Agriculture analysis indicated $3 billion of the decline in U.S. farm product exports during 1981-82 could be attributed to strength of the dollar relative to foreign currencies. Corn exports alone declined almost 10 million metric tons (400 million bushels) due to estimated exchange-rate effects. The authors also indicated a 20 percent trade-weighted, inflation-adjusted rise in the dollar over a two-year period would decrease combined U.S. exports of corn, wheat, and soybeans by 16 percent from levels that would otherwise exist. The analysis assumes that other market influences will remain unchanged.[83]

Market responses to weakness in the dollar's exchange rate from 1986 through mid-1988 probably involved longer lags, particularly since they followed an extended period of high prices and a relatively strong U.S. dollar. High grain and oilseed prices during the 1970s and the strengthening U.S. dollar in the early 1980s encouraged large investments in agriculture and farm input industries in many parts of the world. Investment included machinery, fertilizer and chemical production capacity, land clearing, drainage, irrigation, development of improved varieties, and related production-increasing activities. These investments will continue to be used in production for an extended period of time, even with lower levels of dollar-denominated world grain prices.

Because of long-term exchange rate effects, it will be important for the U.S. and other industrial nations to give high priority to policies that will promote a reasonably stable and realistic exchange rate of the U.S. dollar. Instability of the U.S. dollar has its roots in U.S. monetary and fiscal policy, including the large but modestly shrinking U.S. budget deficit, with its resulting decrease in funds available for private U.S. borrowing and investment, and a large need for foreign capital in-flows.[84] The U.S. budget deficit has been partially financed by an inflow of foreign capital seeking to earn high U.S. real (inflation-adjusted) interest rates. The exchange rate of the dollar in this situation is influenced by potential large fluctuations in international capital flows with foreign investors' changing perceptions about stability and growth prospects for the U.S. economy. International capital flows also drain investment funds from other nations, reducing foreign economic growth rates and retarding growth of export demand in some traditionally large U.S. agricultural export markets such as Western Europe. High U.S. real interest rates stem from a restrictive U.S. monetary policy that has been used to attract foreign captial and offset inflationary pressures from deficit spending. While U.S. interest rates declined significantly from earlier peak levels, the U.S. inflation rate remained well below the levels of the 1970s, leaving U.S. real interest rates at historically high levels. In mid-1989, the U.S. still had relatively high real interest rates compared with those of Japan and some West European nations. If confidence in the U.S. dollar is weakened by other developments, higher domestic interest rates may be required to ration available loanable funds and attract the required foreign investment into the U.S. to finance the federal budget deficit.

Accelerated growth of the nation's money supply has been suggested as one way to finance the budget deficit. But, that almost certainly would increase U.S. and world inflationary pressures, with the accompanying dangers of a new round of inflation-induced U.S. private and developing-nation debt buildup and more serious adjustment problems in the future. Liberal growth of the U.S. money supply also would be likely to weaken the U.S. dollar, thus making it more difficult for the rest of the world to export to the U.S. and, in some cases, worsening debt-repayment problems of developing nations. In addition, with U.S. interest rates largely deregulated, renewed inflation would be likely to increase the interest cost on the outstanding U.S. government debt of approximately 2.9 trillion dollars and increase the annual budget deficit. Thus, it is unlikley that the U.S. budget deficit problem could be solved by rapid growth in the nation's money supply. An attempt to solve it in that manner would carry large risks of more serious adjustment problems in the future.

As an indication of the changing U.S. budget situation, the annual federal budget deficit in 1979 was approximately $28 billion. With a sharp reduction in U.S. federal income tax rates and continued large government spending, it reached $221 billion by fiscal 1986, declined to $150 billion in fiscal 1987, increased to $151 billion in fiscal 1989, and is expected to be in the $125 to $150 billion range in fiscal 1990.

With growing concern that the U.S. budget deficit would continue at or near a $200 billion annual rate for the foreseeable future, the U.S. Congress in late 1985 passed the Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Reduction Act. This act provides for a series of increasingly large annual reductions in expenditures in most categories of the U.S. budget, including defense programs, but excluding social programs and long-term agricultural land-idling programs. Its original goal was to balance the U.S. budget as the 1980s came to a close. Although that was not achieved, if this act is implemented fully and continually in the next few years, it may substantially reduce the U.S. budget deficit, thus permitting a further decline in real U.S. interest rates. That could help to stabilize or slightly weaken the exchange rate of the U.S. dollar against developing nations' and other grain exporters' currencies. If so, that would be one of several factors helping to maintain a more stable and gradual uptrend in U.S. agricultural exports.

Additional benefits from reducing the U.S. budget deficit would include a decline in interest-related cost pressures on U.S. agriculture and increased U.S. private investment to stimulate the nation's economy and improve its productivity. Lower real interest rates also would improve trade by easing interest cost burdens of developing nations and accelerating their economic growth rates. Dealing with exchange rates through monetary policy alone runs the risk of sharp and disruptive fluctuations in the value of the U.S. dollar. But, a more balanced U.S. fiscal and monetary policy approach would be less likely to cause such reactions. With the far-reaching exchange rate impacts outlined here, U.S. general economic policy developments may be nearly as important to the future of U.S. agriculture as changes in farm price support programs.

Trade Subsidies[85]

Trade subsidies can take several forms, including direct payments to producers and/or processors, price or commodity rebates to foreign buyers, subsidized financing terms, or outright donations of products or services to foreign importers. These subsidies typically are used to increase an exporting nation's share of global trade and/or reduce surplus domestic supplies while protecting incomes of its agricultural producers. The U.S. and several other nations use such subsidies. During the past two decades trade negotiations between the U.S. and trading partners have been aimed at reducing export subsidies and other restraints to foreign trade. But in the last four and one-half years, export subsidies by the U.S. and the EC have been quite large as each attempted to protect its agriculture from adverse developments in the world economy and to increase its respective share of world food trade. Current U.S. examples of such subsidies include deficiency payments to grain producers under the U.S. target price system (these payments also are a compensation to producers for idling a sizable part of their cropland base), PL-480 export programs, the Export Enhancement Program, and exports of by-product feed ingredients from the corn milling industry, which are influenced by motor fuel tax exemptions on alcohol fuels.

U.S. trade policy in 1989-90 continued to be directed at the large grain subsidies used by the EC to export its surplus agricultural production, and continuing large Japanese nonagricultural trade surpluses with the U.S. The U.S. share of global exports of several major agricultural commodities declined sharply from 1981 to 1986. In some instances, the EC share of those same commodity exports increased during the same period. As a reaction to its declining trade shares, the U.S., in mid-1985, implemented the Export Enhancement Program, which was initially targeted against the EC's subsidized wheat exports. The program was sharply expanded from 1986-87 through 1989-90, and was broadened to include exports of barley, vegetable oils, and sorghum. It provides bonus quantities of commodities from U.S. government-owned grain or other farm product inventories when designated importers purchase commercial U.S. supplies. Its purpose is to make U.S. agricultural exports competitive with subsidized EC exports. Through mid-1990, this program appears to have contributed strongly to increased U.S. wheat and barley export shares even though it has been met by large EC export subsidies. Recipient nations and areas under the program have included the Middle East, North Africa, Eastern Europe, the USSR, and China. Pending U.S. agricultural legislation is expected to mandate that U.S. export subsidies are to be maintained at high levels for the next few years.

Trade subsidies should be used with caution. Escalating U.S. and EC subsidies led to an agricultural trade war in the late 1980s. Each side progressively increased its subsidies and/or lowered its prices to increase its respective trade share, while both sides incurred progressively larger costs. The trade war at times spilled over into nonagricultural products, with the U.S. placing large import duties on certain industrial products from Canada, Brazil, and Japan, and with the EC, at times, also threatening to protect its economy from such imports.

Large export subsidies of the U.S. and other major exporters have a strong negative impact on the agriculture of grain-importing developing nations and nonsubsidizing exporting countries. Subsidies tend to depress prices in importing nations, weakening or removing the incentive for farmers in developing countries to expand production. In the long run, that could work to the disadvantage of consumers in lower-income developing countries by limiting their nations' ability to become self-sufficient in food production. For nonsubsidizing exporters, the subsidies depress prices, reduce agricultural incomes and reduce trade shares from levels that would otherwise exist. With these potential secondary impacts, it is advisable to use trade subsidies with considerable caution. Such tools should not be expected to solve food trade problems arising from excessive indebtedness, slow global economic growth, overvalued currencies, and excess resources in the agricultural sectors of grain exporting nations.

U.S. Clean Air Legislation and Grain-Based Alcohol Fuels

As of mid-1990, the House of Representatives and Senate in the U.S. Congress have passed clean air legislation that has the potential to increase the demand for corn-based alcohol fuels in the U.S. in the next three to five years. At this writing, the legislation is expected to be signed by President Bush. The legislation significantly tightens air pollution standards for carbon monoxide and ozone, as well as aromatic compounds used for octane enhancement.[86] The tighter standards are expected to increase the demand for oxygenated motor fuels in 35 to 50 U.S. cities where air pollution problems are greatest. They could conceivably result in demand for an ethanol-based compound, ETBE, in these cities at a level similar to that in 8 western U.S. cities where local standrads in 1989 mandated the use of aerated fuels during winter months.

Industry sources indicate ETBE had approximately a 30 percent average market share in five western cities in 1989. ETBE is one of several alternatives for meeting the tighter standards. Its market share will depend on cost relationships with other alternatives including MTBE, a product of methyl alcohol produced from natural gas feedstock. Other factors influencing ETBE's market share will include retailer and refiner attitudes about the product as well as technical considerations in transporting and handling it, and reconciliation of scientific controversies about ETBE's impact on ozone levels. Another important influence on the use of ETBE for aerated fuels will be the future of the $.06 per gallon federal motor fuel tax exemption for alcohol fuels. As of mid-1990, the tax exemption is scheduled to expire on September 30, 1993, but a move is under way to extend its expiration to the year 2003. The tax exemption is important in making 10 percent ETBE-gasoline blends competitive with other alternatives and is likely to remain important unless crude oil prices rise sharply.

Approximately 345 million bushels of corn were processed into alcohol fuels in the U.S. in 1989.[87] With an extension of the tax exemption, an eventual market potential would exist for perhaps 100 to 500 million bushels of additional U.S. corn to be processed into alcohol fuels. A time lag of up to five or six years might be needed before full potential demand develops, partly because of the time needed to expand U.S. alcohol fuel manufacturing capacity. In most cases, expansions would be expected to come as additions to or modernization of existing plants. The expansions would increase the output of corn gluten feed and meal, the primary by-product feeds associated with alcohol manufacturing. These feeds have a medium to high level of protein content and are a competitor of soybean meal.

Increased U.S. demand for corn at the maximum potential level, combined with long-term U.S. land idling programs, would tend to tighten U.S. and world corn supplies beyond levels indicated in the long-range projections section of this report. A tighter supply situation would be expected to increase corn prices at least modestly from the projected levels and would increase corn market sensitivity to weather developments. Once the additional alcohol production capacity was in place, sharply higher prices might be needed in times of short crops in order to curtail other corn uses by the amount required to balance supplies with demand. The price rationing process likely would lead to greater reductions in U.S. grain feeding and exports in years of short crops than would be the case without increased use of alcohol fuels. Due to high fixed costs associated with alcohol processing plants, processors likely would be reluctant to reduce their volume of output until processing margins were severely depressed.

In summary, the pending U.S. air pollution control legislation does not guarantee a large new market for U.S. corn, but it may encourage such growth. The resulting market expansion would be beneficial for producers, handlers and processors of corn, and input suppliers for the grain industry. The resulting extra demand for corn at times might require adjustments by other users of corn, particularly in years of short crops. Also, expanded output of by-product feeds would require the development of new markets for these products. The by-products of the U.S. corn processing industry have become a source of trade policy tensions with the EC, because western Europe represents a major market for corn gluten feed and meal. Changes in international trade policies resulting from the GATT negotiations also will affect the potential export market for these products.

Biotechnology: Implications for Future World Agricultural Trade[88]

Recent scientific developments have made possible the transfer of genes and other processes to accelerate progress in plant and animal breeding. These developments may sharply increase agricultural productivity in future years. However, biotechnology is in its infancy, and its full impact will not be realized for at least a decade. Biotechnology encompasses a broad area including not only plant and animal breeding but also the development of plant and animal growth stimulants, biological control agents (for insects, weeds, diseases, etc.), transfer of favorable genes from one plant or animal to another, new processing techniques, and development of new crops and agricultural products. These developments eventually may have major impacts on global production and trade patterns as well as on the structure of production agriculture and agribusiness industries.

The most economically significant applications of biotechnology currently on the horizon are for livestock. Two developments in biotechnology that may have commercial application and trade impacts in livestock products in the early 1990s are: (1) a naturally occurring hormone for cattle (bovine somatotropin or BST) that increases milk production per cow by 10 to 20 percent from levels occurring under current production programs and (2) a growth stimulant for swine (porcine somatotropinor or PST) that may increase feed conversion efficiency by one-fifth or more from levels typical in current feeding programs and also reduces the fat content of the meat. These developments could provide a major trade advantage to countries that permit their use and are early adopters. These two developments alone could have far reaching effects on U.S. and world agriculture if they are widely adopted.

Livestock Biotechnology

The milk production hormone would sharply reduce the number of dairy cows (and dairy farmers) needed to meet market demand, would spread fixed costs of dairy production on individual farms over more units of milk output, and might significantly lower total production costs per unit. If used in some countries but not others, it could provide user nations with a major trade advantage. Impacts on grain, roughage, and protein meal consumption are unclear at this time. Accompanying management requirements for successful use may accelerate changes in the cost advantage of larger farms that have the necessary specialized management personnel. The swine growth stimulant, PST, may sharply reduce grain requirements in the U.S. and world pork industries, while increasing protein meal requirements somewhat and enhancing the quality of the final consumer product. Because the swine industry is one of the largest sources of demand for coarse grains, the stimulant would tend to increase excess grain supplies in exporting nations while reducing grain import needs of major importing nations that are adopters and users of the product. The stimulant thus could modestly reduce global grain trade at some future time and increase oilseed and oilseed meal trade. Other issues surrounding these two products of biotechnology relate to consumer acceptance.

Another currently available technology is the ability to transplant fertilized livestock eggs and embryo. Through this technique, offspring of genetically superior animals can be expanded in number much more rapidly than in the past. The process assists livestock breeders in developing animals with superior feed conversion efficiency, rates of gain, tendencies toward multiple births, desirable carcass qualities, and other beneficial features. In the next decade or two, this process may improve production efficiency in animal agriculture and reduce grain requirements per unit of meat output. The ability to transfer genes through biotechnology also may accelerate improved productivity of the livestock sector in other areas such as the average number of calves per cow or pigs per litter, disease resistance, carcass quality, milk output, and rates of gain per head per day. It too could tend to restrain future growth in global grain trade through reduced feed requirements per unit of meat or milk produced.

Crop Biotechnology

Potential productivity gains from applying biotechnology to crop production are largely speculative at this time. Major economic impacts in this area may be 8 to 15 years in the future. Eventual improvements in crop productivity may come from breeding of grains, oilseeds, and other crops with greater tolerances to drought and herbicides; transplanting nitrogen fixation ability from legumes to grains; development of commercially applicable hybrid soybeans; development of grains with greater resistance to cold, frost damage, insects, and lodging; development of crops with naturally occurring herbicide and insecticide qualities; and development of crops to more adequately meet quality needs of certain markets. These developments could substantially increase productivity per hectare, reduce total input requirements and costs per unit, diminish the sensitivity of crop production to adverse weather and contribute to expanded use of certain crops. If these potential results are attained, they also would expand global grain supplies. That would challenge policy makers to develop incentives to increase the availability of food for undernourished persons in developing nations and minimize pressures for predatory trade practices by agricultural exporters seeking larger shares of slowly growing world markets. While major biotechnology developments in grain may be several years away, progress is being made in the development of varieties with specific herbicide tolerances and resistance to certain insects.

Biotechnology developments that reduce the need for herbicides and insecticides would help allay growing U.S. and West European concern about water pollution stemming from heavy use of agricultural chemicals in crop production. These developments also could reduce per unit costs of crop production, enlarging the world market for grains and oilseeds by making livestock-poultry-dairy diets more affordable to the developing world. If successful, such developments would create major growth opportunities in the plant breeding and seed industries, but are likely to create a need for major additional restructuring and disinvestment in the agricultural chemical industry and possibly in the nitrogen fertilizer industry.

Development of New Uses for Farm Products

Biotechnology also may expand industrial markets for agricultural crops, although such developments are somewhat speculative at this time. In the last two decades, developments in biochemistry, chemical engineering, and grain processing have led to the creation of new corn sweeteners and alcohol fuel industries and new uses of corn starch in industrial applications. These developments have resulted in approximately 17.8 million tons (700 million bushels) of new demand for U.S. corn in the past 15 years. While these new industries have had a negative impact on U.S. and world sugar and soybean meal demand, the increased demand for corn has had a positive impact on the financial position of corn producers and related agribusiness sectors. Recent research also has created technically feasible uses for vegetable oils as a dust suppressant in grain elevators, a base for ink in printing operations, and for other industrial and agribusiness applications of grain and oilseed products. As another example, research by the Agricultural Research Service of the U.S. Department of Agriculture created a degradable plastic produced partly from corn starch. The economics of commercial production are not yet clear, but use of the product for garbage bags and other containers may moderately increase demand for U.S. corn.[89] Some U.S. cities are requiring use of such bags for household garbage.

Future research may generate additional new uses for grain, vegetable oils, and oilseed crops as raw materials in industrial processes, and could lead to the development of entirely new crops to meet specific industrial needs. With that possibility in mind, limited research is being conducted on industrial applications of new oilseeds not currently grown on a commercial scale. As with research in crop and livestock biotechnology, it will be important for policy makers and managers of farm input, production, and marketing firms to monitor new developments in this area. Creation of large new blocks of demand for farm products through research in processing methods and biochemistry is not anticipated in the near future, although significant developments in this field could occur in the early part of the twenty-first century.

Because of the newness of biotechnology, its full impacts are largely speculation at this time. Major developments in biotechnology may have profound impacts on global food trade, the structure of production agriculture, appropriate domestic and world trade and food assistance policies, agribusiness firms, the competitiveness of U.S. agriculture in world markets, food security, and the ability of the world to meet the food needs of people in developing nations whose diets are below minimum nutritional standards. Present indications are that crop biotechnology will not have major impacts on world agriculture before the turn of the century. However, significant impacts in livestock production may occur during the next 5 to 10 years and may affect grain utilization and trade.

Other Trade Policy Developments and Issues

Dealing With Developing-Nation Debts

Third World debt problems are interrelated with factors causing the strong U.S. dollar relative to many developing-nation currencies, and are a contributor to slower growth in agricultural imports by developing countries in the mid- to late 1980s.[90] Global policies for dealing with the exchange rate problem and high real interest rates may provide partial relief to heavily indebted nations. But, lower real interest rates alone will not fully resolve debt burdens. Many developing-nation loans are short term in nature. Lengthening repayment periods is important in helping those countries through current financial difficulties. Other important tools include restrained monetary and fiscal policies in developing nations, policy measures to improve productivity of the economies involved, partial debt forgiveness, and lender exchanging of debt for equity in the developing-nation industries. While the task is a difficult one requiring caution and a few more years of adjustment, the outcome is critical for the world economy. Widespread inability of developing countries to meet debt servicing commitments could endanger multinational lending institutions, risk serious disruption of the world monetary system, slow world economic growth, or set the stage for a serious worldwide recession. Resolution of Third World debt problems will be important for agricultural exporting nations and for the physical well-being of people living in developing countries. These nations were one of the fastest growing import markets for farm products during the 1970s. With a shift to policies promoting economic stability and growth in the Third World, they may offer substantial growth in global demand for farm products in the years ahead.

Trade Protectionism

In today's global economy, there are strong pressures for increased protection of domestic industries against foreign imports. For example, the EC has threatened to restrict its imports of corn gluten feed and meal, oilseeds, and other U.S. farm products. In the United States, Congress passed extensive trade legislation requiring retaliation against imports from nations that consistently run large trade deficits with the U.S. Other evidence of protectionism includes the voluntary restraints on Japanese exports of automobiles into the U.S., developed after U.S. pressures for more direct actions. The U.S. also has restricted imports of Canadian hogs, imposed a tariff on imports of Canadian cedar shingles, threatened to take action against imports from Brazil unless that nation liberalizes policies relating to imports of U.S. products, and strongly warned the EC against tightening its import restrictions.

These are only a few examples of a large list of recent and/or proposed protectionist trade policies. A Washington University study indicates these restrictions cost United States consumers about $58.5 billion annually in the form of hidden taxes, along with additional long-run costs through reduced incentives for innovation and improved productivity.[91] With unemployment problems in some countries, strong foreign competition, and domestic political pressures, many other trading nations also are facing strong pressure to protect domestic industries through trade restrictions. However, the lessons of the 1930s should be a reminder that sharply increased protectionism leads to declining trade and sluggish world economic activity.[92] Protectionist trade policies were a major contributor to the world economic depression of the 1930s and are an example of the dangers of increased trade protectionism. In establishing trade policy, policy makers should recognize that trade requires two-way exchange between nations. One nation's exports generate revenue that is used to purchase its trading partner's products. The U.S. agricultural sector and the U.S. economy thus have a very important stake in resisting current tendencies toward increased trade protectionism in the industrial sector that could affect foreign nations' ability to purchase U.S. products.

Food Security

Food security is a critical and complex policy issue for much of the developing world and is being brought to the forefront by sharply reduced global grain and oilseed stocks that resulted from 1987 and 1988 droughts. One aspect of the problem is illustrated by estimates that the caloric intake of more than 800 million people, or 60 percent of the population of less developed nations, is below the minimum standards established by the United Nations Food and Agricultural Organization and the World Health Organization.[93] Furthermore, these estimates do not reflect quality dimensions of diets such as protein levels and other noncaloric nutritional requirements. The hunger problem is concentrated in Sub-Saharan Africa, parts of Latin America, and South Asia. Although food production increased in some African nations in the last three years, serious long-term problems and challenges in food production remain. Chronic food shortages continue in some parts of the continent.[94]

Another dimension of world food security is in a standard for grain carryover stocks. Some world food authorities place minimum stock levels for food security purposes at 17 to 18 percent of annual world utilization. Global carryover stocks in 1990 are estimated at 16.6 percent of annual utilization, just below to the minimum standard.[95] But, the standard is only a general guideline. Geographic distribution of available stocks also is important from a food security standpoint. The location of stocks can determine whether a supply of grain is readily available to quickly meet emergency food shortages. Location also can affect prices paid to producers in exporting regions, as is currently the case. Thus, formulation of acceptable policies for adequate world grain stocks must include impacts on both surplus and deficit food producing nations.

A short-run aspect of food security is the ability to meet emergency food needs resulting from drought or other natural disasters. This includes the availability of supplies and the financing and distribution systems necessary to promptly and efficiently deliver the products where they are needed. Difficult issues yet to be resolved include the desired size and locations of reserve stocks, methods of sharing storage costs, methods of acquiring and releasing stocks to minimize disruptions in importer and exporter nations, and availability of financial and physical support services to quickly move supplies to needed locations. These issues are especially important for the people of Sub-Saharan Africa, the Indian subcontinent, and parts of Latin America where food shortages are a frequent occurrence.[96]

Long-run dimensions of food security include population trends, policies for increasing food production in food-deficit developing nations, and improved distribution systems. Global food production is sufficient to adequately meet the needs of the world's current population, but uneven distribution of food reflects severe poverty in many areas. Lack of funds for food purchases and physical distribution problems are chronic long-term problems in the food situation of the world's poorest nations. Dealing effectively with these problems is a major challenge for current and future generations. Its importance is highlighted by the fact that the Third World has been the flashpoint for East-West conflicts,[97] indicating that food security, poverty or economic well being, and world peace are closely interrelated.

Policies Related to Value-Added Exports

Value-added exports benefit the exporting nation by enabling its population to gain both from employment in processing activities, and from an economic multiplier effect as expenditures in the processing sector are dispersed through its economy. Global trade in value-added products has grown rapidly in recent years and includes exports of meats, fruits, vegetables, and processed grain products. The soybean industries in the EC and Brazil are examples of policies that encourage exports of value-added products at the expense of other processing nations. As noted in an earlier section of this report, the U.S. share of global processed soybean product exports dropped substantially from 1979-80 through 1988-89 while Brazil and the EC enjoyed a sharply rising share.

Brazil encourges exports of processed products rather than soybeans by differential export taxes, with a larger tax on soybean exports than on exports of soybean products, as well as by export quotas on soybeans; subsidized interest rates for processors; and duty-free imports of equipment used in production of export goods.[98] In the EC, a modest import tax is applied to soybean oil, thus favoring imports of soybeans for processing and exports of soybean meal, rather imports of meal and oil. The processing industries in these areas and the U.S. appear to be moving closer to a confrontation. As a result, this issue may be on the list of trade policy questions coming to the forefront in the early 1990s, if not dealt with in the final GATT negotiations.

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Appendix I. Classification of Countries by Economic Category

Appendix I. Classification of Countries by Economic Category.

Developed Market Economies

Australia
Austria
Canada
Denmark
Finland
West Germany
France
Iceland
Ireland
Italy
Japan
Luxembourg and Belgium
The Netherlands
Norway
Sweden
Switzerland
United Kingdom
United States

Rapidly and Moderately Developing Nations

Algeria
Argentina
Bolivia
Brazil
Cameroon
Chile
Colombia
Congo
Costa Rica
Cyprus
Dominican Republic
Ecuador
Egypt
Ghana
Greece
Guatemala
Honduras
India
Indonesia
Iran
Iraq
Israel
Ivory Coast
Jamaica
Jordan
Korea (South)
Kuwait
Lebanon
Liberia
Libya
Malaysia
Mexico
Morocco
New Zealand
Nicaragua
Nigeria
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Portugal
Puerto Rico
Saudi Arabia
Senegal
Singapore
South Africa
Spain
Syria
Taiwan
Thailand
Trinidad
Tunisia
Turkey
Uruguay
Venezuela
North Yemen
Zambia
Zimbabwe

Centrally Planned Economies

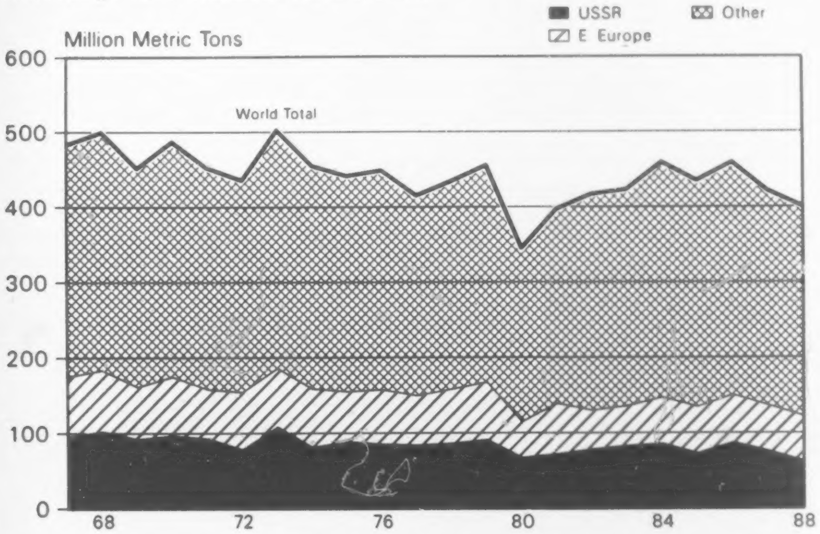
Albania
Angola
Bhutan
Bulgaria
China
Cuba
Czechoslovakia
East Germany
Hungary
Kampuchea (Cambodia)
Korea (North)
Laos
Mongolia
Mozambique
Poland
Romania
South Yemen
USSR
Vietnam
Yugoslavia

Other Developing Nations

Afghanistan
Bahamas
Bahrain
Bangladesh
Barbados
Benin
Botswana
Burma
Burundi
Canary Islands
Central African Republic
Chad
Comoros
Cape Verde
Dijibouti
Dominica
Ethiopia
Equatorial Guinea
Fiji
French Pacific Islands
French West Indies
Gabon
The Gambia
Grenada
Guinea
Guinea Bissau
Guyana
Haiti
Hong Kong
Kenya
Lee Wind Islands
Lesotho
Madagascar
Malawi
Maldives
Mali
Malta
Mauritania
Mauritius
Nepal
Netherland Antilles
Niger
Oman
Other West African
Qatar
Rwanda
St. Lucia
Sao Tome Principe
Seychelles
Sierra Leone
Solomon
Somalia
South Pacific Islands
Southwest African
Sri Lanka
Sudan
Surinam
Swaziland
Tahiti
Tanzania
Togo
Uganda
United Arab Emirates
Upper Volta
Western Samoa
Zaire

Appendix II. Potato, Cassava, and Pulse Production by Major Producing Areas

Appendix II, Figure 1. World Potato Production in Millions of Metric Tons by Major Producing Areas, Calendar Years 1967-88.



Sources: Food and Agriculture Organization of the United Nations, *Production Yearbook* (Rome, Italy), various issues.

Appendix II, Table 1. Cassava Production in Major Producing Nations from 1973 through 1988 in Millions of Metric Tons.

Area or Country	1973	1979	1981	1986	1987	1988
China	2.0	2.5	3.5	3.5	3.3	3.4
India	6.4	6.1	5.9	4.9	3.6	5.2
Indonesia	11.2	13.8	13.3	13.3	14.4	15.2
Philippines	0.5	2.3	2.3	1.7	1.8	1.8
Thailand	5.7	11.1	17.7	15.3	19.6	22.3
Others	0.4	0.4	0.5	4.2	4.0	4.1
Far East Total[a]	26.1	36.1	43.2	42.9	46.9	52.0
Ghana	1.6	1.8	1.7	2.9	2.9	3.3
Mozambique	2.5	3.0	3.2	3.3	3.4	3.4
Nigeria	9.6	10.5	11.0	14.7	14.0	14.0
Tanzania	3.8	5.1	6.0	6.2	6.0	5.0
Zaire	11.0	12.0	13.2	16.2	16.3	16.3
Others	12.5	13.6	14.8	14.8	15.0	15.0
Africa Total[a]	41.0	46.0	49.8	58.1	57.6	57.0
Brazil	26.5	25.0	24.5	25.6	23.5	21.6
Colombia	2.0	1.9	2.2	1.3	1.3	1.2
Others	3.5	4.1	4.2	5.2	5.8	6.2
Latin America Total[a]	32.0	30.9	30.8	32.1	30.6	29.0
World Total[a]	101.3	117.6	128.0	133.2	135.1	138.2

Sources: Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Food Outlook, No. 8, September 1986*, and FAO *Production Yearbook*, Vols. 40, 41, & 42, 1986, 1987, and 1988.

[a] Totals may not add up due to rounding.

Appendix II, Table 2. World Pulse Production in Major Producing Areas from 1973 through 1988 in Millions of Metric Tons.

Area or Country	1973	1976	1978	1979	1980	1982	1984	1986	1987	1988
Asia	20.7	22.9	22.4	22.2	19.9	22.2	24.0	24.6	23.3	23.2
Africa	4.7	5.8	5.6	5.7	5.4	6.0	5.0	7.1	6.6	6.9
C. America	1.6	1.3	1.7	1.5	1.6	1.8	1.8	1.9	1.7	1.8
S. America	2.9	2.6	3.0	3.2	2.7	3.8	3.5	3.1	2.9	3.9
N. America	1.0	1.1	1.3	1.3	1.7	1.7	1.4	1.8	2.4	1.7
W. Europe	2.0	1.6	1.8	1.8	1.9	1.9	2.7	3.9	4.6	5.3
E. Europe	0.8	0.6	0.8	0.7	0.8	1.0	1.4	1.5	1.6	1.6
USSR	8.4	8.7	7.8	4.3	6.4	6.5	8.8	7.9	9.9	8.7
Oceania	0.1	0.2	0.1	0.2	0.2	0.3	0.6	0.9	1.6	1.6
World Total[a]	42.2	44.8	44.5	40.9	40.6	45.2	49.1	52.6	54.6	54.7

Sources: Food and Agriculture Organization (FAO) of the United Nations (Rome, Italy), *Food Outlook*, 1983; Statistical Supplement, March 1984 and February 1987; and 1987, 1986 FAO *Production Yearbook*, Vols. 40, 41, & 42, 1986, 1987, and 1988.

[a] Totals may not add up due to rounding.

Appendix III. Major Destinations of U.S. Soybean Exports in 1975-76 and 1988-89

Appendix III, Table 1. Percentage Shares of U.S. Soybean Exports to Major Foreign Destinations in 1975-76 and 1988-89.

Region or Country	1975-76	1988-89
	Percentage	
Western Hemisphere	3.7	9.7
European Community	60.0	42.8
Other Western Europe	1.5	1.1
Eastern Europe	1.5	0.7
Israel	2.7	1.9
Japan	21.6	21.8
Taiwan	5.2	11.2
Others	3.8	10.8

Sources: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, various issues.

Appendix IV. Sources of U.S. Beef and Pork Imports in 1988-89

Appendix IV, Table 1. Percentage Shares of Dollar Value of U.S. Beef and Veal Imports from Major Foreign Origins in 1988-89.

	1988-89 Percentage
Canada	7.1
Central America	6.4
Brazil	2.9
Argentina	7.9
Australia	37.8
New Zealand	30.9
Others	6.9

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1990.

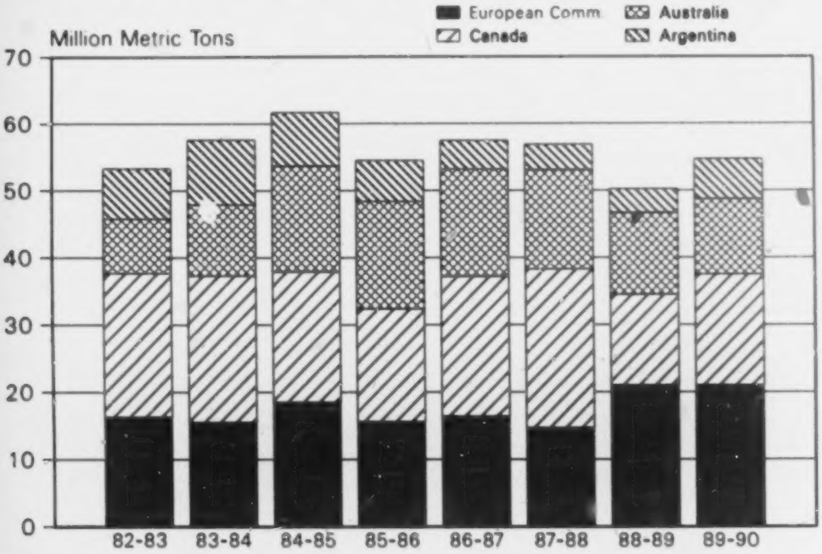
Appendix IV, Table 2. Percentage Shares of Dollar Value of U.S. Pork Imports from Major Foreign Origins in 1988-89.

	1988-89 Percentage
Canada	46.7
European Community	29.8
Eastern Europe	20.6
Others	2.9

Source: U.S. Department of Agriculture, Economic Research Service, *Foreign Agricultural Trade of the United States*, January-February 1990.

Appendix V. Wheat and Coarse Grain Exports by Major Non-U.S. Exporters

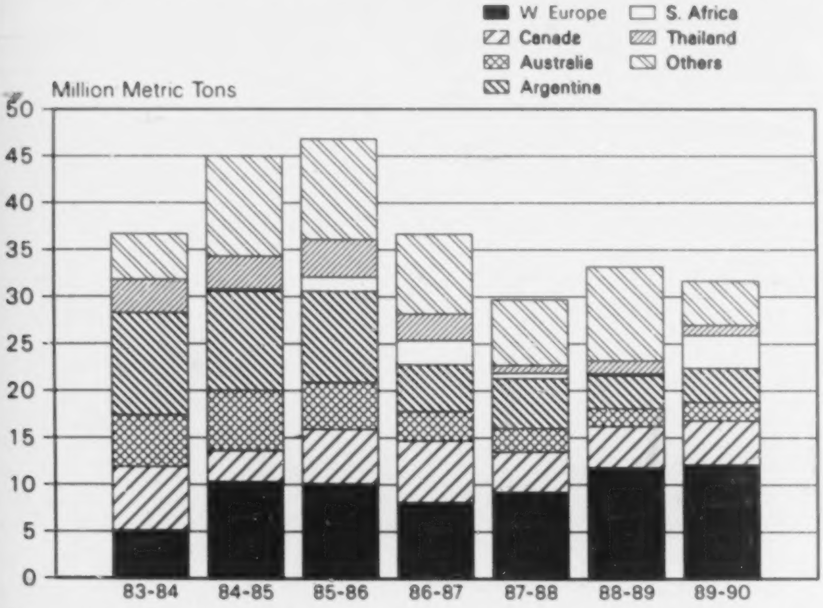
Appendix V, Figure 1. Wheat Exports by Major Non-U.S. Exporters, July-June 1989-90 and Comparisons with Recent Years in Millions of Metric Tons.[a]



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 4-89, April 1989; FG 4-90, April 1990; various other issues.

[a]From 1982-83 on, the EC is EC-12.

Appendix V, Figure 2. Coarse Grain Exports by Major Non-U.S. Exporters, October-September 1989-90 and Comparisons with Recent Years in Millions of Metric Tons.



Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 4-89, April 1989; FG 4-90, April 1990; various other issues.

Appendix VI. World Milk Production, 1968-89, by Major Producing Regions

Appendix VI, Table 1. World Milk Production, 1968-89, by Major Producing Areas in Millions of Metric Tons.

	Avg. 1968-72	1973	1976	1981	1982	1983	1984	1986	Prelim. 1988	Forecast 1989
U.S.	53.4	52.4	54.3	60.2	61.5	63.4	61.4	65.0	66.0	66.0
EC-12	94.0	97.8	97.9	104.9	108.2	118.2	116.2	116.6	108.5	109.0
USSR	82.6	88.3	91.8	88.9	91.0	96.5	97.9	102.2	106.4	107.3
Eastern Europe	31.7	34.7	35.7	40.2	39.6	42.1	43.7	43.4	42.9	42.8
India	21.7	23.1	23.7	14.0	14.9	16.0	17.1	19.5	22.5	24.0
Other Western Europe	21.6	22.1	22.3	22.5	22.8	16.3	16.6	16.1	15.5	15.6
Brazil	7.3	7.2	6.5	10.5	10.1	10.7	10.8	11.6	13.2	13.3
New Zealand	6.2	6.0	5.7	6.7	6.8	6.9	7.6	8.2	7.9	7.5
Australia	7.3	7.3	7.0	5.3	5.4	5.7	6.1	6.2	6.3	6.4
Canada	8.2	7.7	7.6	8.0	8.3	7.9	8.1	7.9	8.2	8.3
Total[a]	334.1	346.6	354.5	361.2	368.6	383.7	385.8	396.8	397.5	400.2

Sources: U.S. Department of Agriculture, Foreign Agriculture Service, *Foreign Agriculture Circular: Dairy, Livestock and Poultry: U.S. Trade and Prospects;* FDLP 1-89, June 1989; FDLP 1-88, November 1988; FDLP 1-87, November 1987; FDLP 2-86, November 1986; FDLP 1-86, May 1986; FDLP 1-85, March 1985; FDLP 6-76, December 1976.

[a] Total may not add up due to rounding.

Appendix VII. Long-Term Trends in Wheat and Coarse Grain Production and Trade for Selected Regions and Nations

Appendix VII, Table 1. Long-Term Trend in Grain Production for Selected Regions and Nations in Millions of Metric Tons.[a]

	1895	1903	1913	1923	1933-34	1935-39	1955	1963	1973	1983	1987[h]	1988[h]
Australia	.83[b]	.50	2.89	3.72	4.77[c]	5.05	6.40	10.12	14.80	10.95	19.30	21.34
Argentina	3.46[d]	6.61[d]	10.19	14.03	14.82	14.20	11.54	14.52	10.02	24.21	22.52	21.21
Canada	2.66	3.94	7.79	14.93	8.85	10.62	22.95	25.41	36.58	47.21	51.64	35.35
Eastern Europe[e]	21.76	24.42	27.97	24.77	34.23	29.15	N/A	23.41[b]	68.88	87.54	102.86	100.52
India	6.95[c]	8.10[c]	12.98	15.23	14.17	10.81	13.44	17.76	32.92	46.04	70.24	73.69
Mexico	2.10[d]	2.79	2.36	3.16	2.32	2.19	4.04	8.29	2.02	11.62	22.99	21.57
China	N/A	N/A	N/A	N/A	N/A	14.21[f]	N/A	N/A	62.97	135.62	185.07	180.94
North Africa	3.20	4.20	4.90	6.92	6.85	7.38	9.30	9.83	10.20	12.97	25.92	34.75
South Africa[d]	N/A	N/A	.95	.98	1.96	2.47	4.13	5.20	12.97	6.50	11.34	10.98
Turkey[c]	1.84	1.66	1.44	N/A	2.71	3.69	8.01	7.89	8.00	13.80	29.01	30.72
USA	69.24	77.23	86.80	84.74	77.52	84.65	118.18	143.78	199.03	295.70	273.61	199.23
USSR	18.07	25.00	39.58	12.30	41.34	47.32	N/A	66.12	178.04	140.50	198.81	184.16
Brazil	N/A	N/A	N/A	3.99[g]	N/A	5.46[g]	6.98[g]	7.70[g]	16.93[d]	21.35[d]	33.74	30.74
Western Europe	28.22	34.75	36.42	35.59	44.69	41.60	51.98	74.80	115.73	145.26	184.59	194.17
World Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	848.25	1,082.13	1,338.60	1,259.52

Sources: U.S. Department of Agriculture, *Yearbook*, 1899, 1907, 1915, 1925, 1935; Sanford Evans Statistical Service, Grain Trade Yearbook (Winnipeg, Canada), 1954-55, 1957-58; U.S. Department of Agriculture, *Agricultural Statistics*, 1965, 1974, 1985; and Food and Agriculture Organization of the United Nations, (Rome, Italy), *Food Outlook*, May 1988; FAO *Productions Yearbook* 1987, No. 41; 1988, No. 42.

[a] Wheat, corn, and barley.

[b] Wheat and barley.

[c] Wheat.

[d] Wheat and corn.

[e] Eastern Europe up to 1913 includes Austria which used to be part of Austria-Hungary. Corn production for East Germany up to 1935-39 are estimated. Barley and wheat production for East Germany up to 1933 are estimated.

[f] Corn and barley.

[g] Corn.

[h] Wheat and coarse grains.

N/A—not available.

Appendix VII, Table 2. Long-Term Trend in Net Exports of Grains for Selected Regions and Nations in Millions of Metric Tons.[a]

	1903	1913	1923	1933-34	1934-38	1955	1963	1973	1983	1987	1988
USSR	4.81[d]	7.23[b]	−.10	1.61	.95	2.60	2.37	−17.22	−27.47	−29.13[i]	−33.72
China	N/A	.02[g]	−.59[e]	−2.20	−1.00	.03	−4.57	−6.49	−17.96	−16.31	−16.32
Brazil	−.17[c]	−.44[c]	−.60[c]	−.91[c]	−.92[b]	−1.69[b]	−2.22[b]	−2.99[b]	−4.35[b]	−3.86	−1.27
Japan	−.08[c]	−.17[c]	−.40[b]	−.10[d]	−.46	−3.21	−6.01	−14.44	−21.70	−27.38	−27.63
Egypt	−.00[f]	−.06[e]	−.03[e]	.01[e]	.00[e]	.00[f]	N/A	−.07[f]	−1.40[f]	−9.25	−8.41
Mexico	−.01[f]	−.04[f]	−.09[f]	.00[f]	.03[e]	.05[e]	−.45[e]	−1.17[e]	4.60[e]	−4.51	−5.54
Australia	.03[c]	1.17[c]	1.40[b]	2.42[b]	2.11	2.01	5.07	6.44	16.66	18.31	14.79
Argentina	3.79[d]	7.66	7.11	10.02	10.08	4.50	4.34	6.88	17.07	9.38	9.93
Canada	.18[d]	3.61	7.48	5.27	4.23	6.48	11.45	15.32	28.09	28.54	23.41
Eastern Europe[h]	.98[d]	1.80	.69	2.29	2.41	−3.33	−4.43	−4.82	−6.01	−4.10	−4.50
India	1.32[c]	1.60[b]	.67[b]	.00[b]	.19[b]	−.44[c]	−4.08[c]	1.83[b]	−3.22[b]	0.67	−2.78
USA	2.68[d]	2.99	8.32	.94	.09	9.88	32.32	73.41	90.04	82.81	98.08
South Africa	N/A	−.15	−.03	.03[d]	.32[d]	.47[d]	2.20	1.66	.05	2.19	0.87
Western Europe	−14.94[d]	−20.58	−21.71	−20.30	−18.97	−15.29	−19.25	−17.58	2.83	18.84	19.18

Sources: U.S. Department of Agriculture, *Yearbook*, 1907, 1915, 1925, 1935; Food and Agriculture Organization of the United Nations, *FAO Trade Yearbook* (Rome, Italy), 1958, 1966, 1972, 1973, 1974, 1975, 1984, 1985, 1986, 1987, 1988.

[a] Wheat, corn, and barley.

[b] Wheat and barley.

[c] Wheat.

[d] Wheat and corn.

[e] Corn and barley.

[f] Corn.

[g] Barley.

[h] Eastern Europe up to 1913 includes Austria, which used to be part of Austria-Hungary. Corn and wheat trade for East Germany up to 1934-38 are estimated.

[i] Wheat, corn, barley, and oats.

[j] Wheat, corn, barley, rye, and oats.

[k] Wheat, corn, and oats.

N/A—not available.

Appendix VIII. Comparisons of U.S. and USSR Agriculture

Table 1. U.S. and USSR Population.

Year	USSR Population (Mil.)	% Growth Rate	U.S. Population (Mil.)	% Growth Rate
1970	242.766		205.052	
1975	254.469		215.973	
1976	256.674	0.87	218.035	0.95
1977	259.029	0.92	220.239	1.01
1978	261.256	0.86	222.585	1.07
1979	263.425	0.83	225.055	1.11
1980	265.542	0.80	227.757	1.20
1981	267.722	0.82	230.138	1.05
1982	270.042	0.87	232.520	1.04
1983	272.540	0.93	234.799	0.98
1984	275.090	0.94	237.001	0.94
1985	277.537	0.89	239.279	0.96
1986	280.236	0.97	241.613	0.98
1987	283.100	1.02	243.915	0.95
1988	285.993	1.02	246.113	0.90
1989				
1990				

Sources: Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988; and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 2. U.S. and USSR Grain (Wheat and Coarse Grains) Production.

Year	U.S. Production (Mil. Metric Tons)	% Change (1975 as the Base Year)	USSR Production (Mil. Metric Tons)	% Change (1975 as the Base Year)
1975	243.5		132.0	
1976	252.3	103.6	211.9	160.5
1977	261.4	103.6	184.8	87.2
1978	270.5	103.5	226.3	122.5
1979	296.5	109.6	171.4	75.7
1980	263.1	88.7	178.7	104.3
1981	322.4	122.5	150.4	84.2
1982	326.0	101.1	176.1	117.1
1983	202.9	62.2	179.4	101.9
1984	308.2	151.9	159.1	88.7
1985	340.8	110.6	178.1	111.9
1986	309.0	90.7	198.2	111.3
1987	274.3	88.8	197.0	99.4
1988	199.0	72.5	181.9	92.3
1989	276.8	139.1	197.5	108.6

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-89, April 1989; and FG 4-90, April 1990.

Table 3. USSR and U.S. Grain Yields (Wheat and Coarse Grain) in Metric Tons Per Hectare, 1967-89.

	USSR		U.S.	
	Yield	% Growth Rate (1967 as Base Year)	Yield	% Growth Rate (1967 as Base Year)
1967	1.16		3.10	
1968	1.39	19.8	3.20	3.2
1969	1.20	3.4	3.40	9.7
1970	1.53	31.9	3.10	0.0
1971	1.54	32.8	3.70	19.4
1972	1.47	26.7	3.90	25.8
1973	1.74	50.0	3.67	18.4
1974	1.41	21.6	2.97	-4.2
1975	1.07	-7.8	3.44	11.0
1976	1.75	50.9	3.51	13.2
1977	1.50	29.3	3.67	18.4
1978	1.85	59.5	4.10	32.3
1979	1.42	22.4	4.42	42.6
1980	1.49	28.4	3.75	21.0
1981	1.28	10.3	4.24	36.8
1982	1.53	31.9	4.36	40.6
1983	1.60	37.9	3.52	13.5
1984	1.44	24.1	4.36	40.6
1985	1.63	40.5	4.75	53.2
1986	1.85	59.5	4.68	51.0
1987	1.85	59.5	4.72	52.3
1988	1.73	49.1	3.66	18.1
1989	1.91	64.7	4.45	43.5

Sources: U.S. Department of Agriculture, Economic Research Service, *USSR Outlook and Situation Report*, RS 87-4, May 1987; RS 88-2, May 1988; Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 25-76, October 7, 1976; FG 4-83, February 15, 1983; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-85, March 1985; FG 7-85, May 1985; FG 4-87, April 1987; FG 3-88, March 1988; FG 3-89, March 1989; FG 3-90, March 1990; and Statistical Reporting Service, *USSR Grain Statistics, National and Regional 1955-1975*, Statistical Bulletin No. 564, 1977.

Table 4. Coarse Grain and Wheat Area Harvested in Millions of Hectares in U.S. and USSR, 1989-90, and Comparison with Recent Years.*

	Coarse Grains									
Area or Country	1970-71	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	Prelim. 1988-89	Proj. 1989-90
U.S.	39.7	43.6	43.6	32.9	43.6	45.5	41.5	35.4	32.8	37.1
% Change (1970-71 as Base Year)		109.8	109.8	82.9	109.8	114.6	104.5	89.2	82.6	93.5
USSR	43.9	58.0	58.0	61.2	59.2	58.5	58.6	59.5	57.8	55.9
% Change (1970-71 as Base Year)		132.1	132.1	139.4	134.9	133.3	133.5	135.5	131.7	127.3

	Wheat									
Area or Country	1970-71	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	Prelim. 1989-90
U.S.	17.7	32.8	32.0	24.8	27.1	26.2	24.6	22.6	21.5	25.2
% Change (1970-71 as Base Year)		185.3	180.8	140.1	153.1	148.0	139.0	127.7	121.5	142.4
USSR	65.2	59.2	57.3	50.8	51.1	50.3	48.7	46.7	48.1	47.5
% Change (1970-71 as Base Year)		90.8	87.9	77.9	78.4	77.1	74.7	71.6	73.8	72.9

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Grains*, FG 10-74, April 1974; *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-88, March 1988; FG 3-90, March 1990; *Foreign Agriculture Circular: World Crop Production*, WCP 4-85, April 11, 1985; WCP 4-86, April 1986; WCP 12-87, December 1987; *World Agricultural Production*, WAP 4-89, April 1989; WAP 3-90, March 1990; and personal communications with officials of the U.S. Department of Agriculture, Foreign Agricultural Service.

*Planted area.

Table 5. USSR Grain (Wheat and Coarse Grains) Imports in Millions of Metric Tons.

Year	Wheat	Coarse Grains	Total	% Growth Rate (1975-76 as Base Year)
1975-76	10.1	15.6	25.7	
1976-77	4.6	5.7	10.3	40
1977-78	6.6	11.7	18.3	71
1978-79	5.1	10.0	15.1	59
1979-80	12.0	18.4	30.4	118
1980-81	16.0	18.0	34.0	132
1981-82	20.3	20.1	40.4	157
1982-83	20.8	11.0	31.8	124
1983-84	20.5	11.9	32.4	126
1984-85	28.1	27.3	55.4	216
1985-86	15.7	13.6	29.3	114
1986-87	16.0	10.8	26.8	104
1987-88	21.5	10.4	31.9	124
1988-89	15.5	22.5	38.0	148
1989-90	14.0	23.0	37.0	144

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 3-90, March 1990; and FG 4-89, April 1989.

Table 6. USSR and U.S. Oilseed Production in Recent Years in Millions of Metric Tons.

Year	USSR	% Change, (1975-76 as the Base Year)	U.S.	% Change, (1975-76 as the Base Year)
1975-76	10.577		45.54	
1976-77	10.268	97.1	39.26	86.2
1977-78	11.053	104.5	54.42	119.5
1978-79	10.636	100.6	56.55	124.2
1979-80	10.292	97.3	70.44	154.7
1980-81	10.225	96.7	54.68	120.1
1981-82	10.448	98.8	61.96	136.1
1982-83	10.971	103.7	66.31	145.6
1983-84	10.438	98.7	48.76	107.1
1984-85	9.756	92.2	57.01	125.2
1985-86	10.825	102.3	63.33	139.1
1986-87	10.831	102.4	57.45	126.2
1987-88	11.272	106.6	59.15	129.9
1988-89	12.056	114.0	48.46	106.4
1989-90	11.678	110.4	57.57	126.4

Sources: U.S. Department of Agriculture, Economic Research Service, Thomas W. Bickerton, *USSR Oilseed Production, Processing and Trade*, Foreign Agricultural Economic Report, FAER-232, September 1987; U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Oil Situation and Market Highlights*, FOP 8-89, August 1989; Economic Research Service, *Outlook and Situation Report: Oil Crops*, OCS-25, April 1990; Economics and Statistics Service, *Fats and Oils Outlook and Situation*, FOS-303, May 1981; and FOS-298, February 1980.

Note: USSR 1989-90 production is a forecast. The production includes cottonseed, soybean, and sunflowerseed only.

Table 7. USSR and U.S. Oilseed Harvested Area and Yields in Recent Years in Millions of Hectares and Metric Tons Per Hectare.

Year	USSR Area	% Change (1975-76 as the Base Year)	USSR Yield	% Change (1975-76 as the Base Year	U.S. Area	% Change (1975-76 as the Base Year)	U.S. Yield	% Change (1975-76 as the Base Year)
1975-76	7.780		1.360		25.584		1.780	
1976-77	8.246	106.0	1.245	91.6	24.724	96.6	1.534	86.2
1977-78	8.352	107.4	1.323	97.3	29.682	116.0	2.127	119.5
1978-79	8.411	108.1	1.265	93.0	31.919	124.8	2.210	124.2
1979-80	8.262	106.2	1.246	91.6	35.864	140.2	2.753	154.7
1980-81	8.354	107.4	1.224	90.0	34.173	133.6	2.137	120.1
1981-82	8.267	106.3	1.264	92.9	33.924	132.6	2.422	136.1
1982-83	8.314	106.9	1.320	97.0	33.910	132.5	2.592	145.6
1983-84	8.300	106.7	1.258	92.5	29.540	115.5	1.906	107.1
1984-85	8.026	103.2	1.216	89.4	32.490	127.0	2.228	125.2
1985-86	8.107	104.2	1.335	98.2	30.150	117.8	2.476	139.1
1986-87	8.080	103.9	1.340	98.6	27.790	108.6	2.246	126.2
1987-88	8.470	108.9	1.331	97.9	27.920	109.1	2.312	129.9
1988-89	8.470	108.9	1.423	104.7	28.860	112.8	1.894	106.4
1989-90	8.560	110.0	1.364	100.3	28.490	111.4	2.250	126.4

Sources: U.S. Department of Agriculture, Economic Research Service, Thomas W. Bickerton, *USSR Oilseed Production, Processing and Trade*, Foreign Agricultural Economic Report, FAER-232, September, 1987; U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Agricultural Production*, WAP 5-90, May 1990; WAP 5-89, May 1989; WAP 5-88, May 1988; *Foreign Agricultural Circular; World Crop Production*, WCP 5-87, May 1987; WCP 5-86, May 1986; WCP 5-85, May 1985; and Economic Research Service, *Outlook and Situation Report: Oil Crops*, OCS-22, July 1989.

Note: USSR 1989-90 oilseed area and yields are forecasts. The figures include cottonseed, soybean, and sunflowerseed only.

Table 8. USSR and U.S. Oilseed Meal (44% Protein Equivalent) Production in Recent Years in Millions of Tons.

Year	Cottonseed	Soybean	Sunflowerseed	Total	% Change (1975-76 as the Base Year)
			USSR		
1975-76	1.455	1.382	1.144	3.981	
1976-77	1.402	1.563	1.331	4.296	107.9
1977-78	1.434	0.999	1.383	3.816	95.9
1978-79	1.361	1.152	1.307	3.820	96.0
1979-80	1.456	0.939	1.334	3.729	93.7
1980-81	1.546	0.994	1.132	3.672	92.2
1981-82	1.467	1.300	1.146	3.913	98.3
1982-83	1.290	0.964	1.417	3.671	92.2
1983-84	1.222	1.060	1.423	3.705	93.1
1984-85	1.480	0.865	1.477	3.822	96.0
1985-86	1.610	1.928	1.724	5.262	132.2
1986-87	1.519	1.537	1.691	4.747	119.2
1987-88	1.415	1.545	1.935	4.895	123.0
1988-89	1.582	1.137	1.963	4.682	117.6
1989-90	1.460	1.324	2.006	4.790	120.3
			U.S.		
1975-76	1.195	18.824	N.A.	20.019	
1976-77	1.424	16.769	N.A.	18.193	90.9
1977-78	1.889	20.290	N.A.	22.180	110.8
1978-79	1.710	22.089	0.18	23.979	119.8
1979-80	1.858	24.584	0.359	26.802	133.9
1980-81	1.624	22.055	0.439	24.118	120.5
1981-82	1.986	22.348	0.201	24.535	122.6
1982-83	1.440	24.235	0.434	26.109	130.4
1983-84	1.029	20.646	0.265	21.940	109.6
1984-85	1.571	22.252	0.321	24.144	120.6
1985-86	1.384	22.635	0.357	24.376	121.8
1986-87	1.009	25.182	0.305	26.496	132.4
1987-88	1.494	25.456	0.426	27.376	136.7
1988-89	1.532	22.586	0.298	24.416	122.0
1989-90	1.328	23.814	0.297	25.439	127.1

Sources: U.S. Department of Agriculture, Economic Research Service, Thomas W. Bickerton, *USSR Oilseed Production, Processing and Trade*, Foreign Agricultural Economic Report, FAER-232, September 1987; U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Oil Situation and Market Highlights*, FOP 8-89, August 1989; Economic Research Service, *Situation and Outlook Report: Oil Crops*, OCS-25 April 1990; *Fats and Oils Outlook and Situation*, FOS-303, May 1981, FOS-298, February 1980; and FOS 293, October 1978.

Note: USSR 1989-90 oilseed production is a forcasted figure. The total includes cottonseed, soybean, and sunflowerseed only. The cottonseed meal and sunflowerseed meal use a .81 and .943894 discount rate to calculate soybean meal equivalent, respectively.

Table 9. USSR Oilseed Meal Imports in Recent Years in Millions of Metric Tons.

Year	Imports	% Change, (1975-76 as the Base Year)
1975-76	0.002	100
1976-77	0.039	1,950
1977-78	0.011	550
1978-79	0.069	3,450
1979-80	0.546	27,300
1980-81	0.737	36,850
1981-82	1.661	83,050
1982-83	2.394	119,700
1983-84	0.262	13,100
1984-85	0.636	31,800
1985-86	0.603	30,150
1986-87	3.004	150,200
1987-88	3.082	159,100
1988-89	4.057	202,850
1989-90	4.245	212,250

Sources: U.S. Department of Agriculture, Economic Research Service, Thomas W. Bickerton, *USSR Oilseed Production, Processing and Trade*, Foreign Agricultural Economic Report, FAER-232, September 1987; and U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular, World Oil Situation and Market Highlights*, FOP 8-89, August 1989.

Note: USSR 1989-90 oilseed meal import is a forecast. The import includes cottonseed, soybean, sunflowerseed, rapeseed, and peanut only.

Table 10. U.S. and USSR Cattle, Hog and Sheep Production in Million Head.

				USSR			
	Year	Cattle	% Growth Rate (Average 1969-71 as the Base Year)	Hog	% Growth Rate (Average 1969-71 as the Base Year)	Sheep	% Growth Rate (Average 1969-71 as the Base Year)
Average	1969-71	96.707		57.528		141.789	
	1975	109.122	112.8	72.273	125.6	151.232	106.7
	1976	111.034	114.8	57.899	100.6	147.001	103.7
	1977	110.346	114.1	63.055	109.6	145.373	102.5
	1978	112.690	116.5	70.511	122.6	146.611	103.4
	1979	114.086	118.0	73.484	127.7	148.104	104.5
	1980	115.100	119.0	73.898	128.5	149.423	105.4
	1981	115.057	119.0	73.382	127.6	147.487	104.0
	1982	115.919	119.9	73.302	127.4	148.481	104.7
	1983	117.186	121.2	76.671	133.3	148.522	104.7
	1984	119.558	123.6	78.722	136.8	151.776	107.0
	1985	121.055	125.2	77.914	135.4	149.201	105.2
	1986	120.888	125.0	77.772	135.2	147.330	103.9
	1987	122.103	126.3	79.501	138.2	148.701	104.9
	1988	120.593	124.7	77.403	134.5	147.183	103.8
				U.S.			
	1969-71	112.321		61.72		23.141	
	1975	132.028	117.5	54.693	88.6	15.865	68.6
	1976	127.980	113.9	49.267	79.8	14.581	63.0
	1977	122.810	109.3	54.934	89.0	14.166	61.2
	1978	116.375	103.6	56.539	91.6	13.776	59.5
	1979	110.864	98.7	60.356	97.8	13.725	59.3
	1980	111.192	99.0	67.353	109.1	14.087	60.9
	1981	114.321	101.8	64.512	104.5	14.316	61.9
	1982	115.604	102.9	58.688	95.1	14.376	62.1
	1983	115.001	102.4	54.534	88.4	13.560	58.6
	1984	113.700	101.2	56.694	91.9	12.907	55.8
	1985	109.749	97.7	54.073	87.6	11.993	51.8
	1986	105.468	93.9	52.313	84.8	11.683	50.5
	1987	102.000	90.8	51.16	82.9	12.004	51.9
	1988	98.994	88.1	42.845	69.4	12.424	53.7

Sources: Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 31-42, 1977-1988.

Table 11. Beef and Veal Production in U.S. and USSR in Recent Years.

Country	1974-78 Average	1980	1981	1982	1983	1984	1985	1986	1987	1988	Prelim. 1989	Forecast 1990
Aggregate Comparison (in Millions of Metric Tons)							(Carcass Weight)					
U.S.	11.5	10.0	10.40	10.40	10.70	10.90	11.00	11.30	10.90	10.90	10.70	10.80
% Change with the 1974-78 Average as the Base Year		86.96	90.43	90.43	93.04	94.78	95.63	98.26	94.64	94.61	92.65	93.85
USSR	6.7	6.60	6.60	6.60	7.00	7.20	7.40	7.70	8.30	8.50	8.60	8.60
% Change with the 1974-78 Average as the Base Year		98.51	98.51	98.51	104.48	107.46	110.00	114.93	123.70	126.34	127.61	128.36
Per Capita Comparison (in Pounds)												
U.S.	116.3	96.80	99.60	98.60	100.50	101.40	101.30	103.10	98.40	97.50	N.A.	N.A.
% Change with the 1974-78 Average as the Base Year		83.24	85.68	84.80	86.40	87.20	87.14	88.67	84.60	83.82	N.A.	N.A.
USSR	57.6	54.80	54.40	53.90	56.60	57.70	58.60	60.60	64.60	65.30	N.A.	N.A.
% Change with the 1974-78 Average as the Base Year	95.15	94.37	93.56	98.32	100.19	101.66	105.18	112.07	113.31	N.A.	N.A.	

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-87, September 1987; *Foreign Agriculture Circular: Dairy, Livestock and Poultry*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 2-88, October 1988; FL&P 2-90, March 1990; Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988; and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 12. Milk Production of U.S. and USSR in Recent Years.

Country	1975	1976	1980	1981	1982	1983	1984	1985	1986	1987	Prelim. 1988	Forecast 1989
Aggregate Comparison (in Million Metric Tons)												
U.S.	52.4	54.30	58.20	60.20	61.50	63.40	61.40	64.90	65.00	64.70	66.00	66.9
% Change with 1975 as the Base Year		103.60	111.20	114.90	117.40	121.00	117.30	123.90	124.10	123.40	126.00	127.7
USSR	90.7	91.80	90.90	88.90	91.00	97.90	97.90	98.60	102.20	103.40	106.40	107.3
% Change with 1975 as the Base Year		101.20	100.20	98.00	100.30	107.90	107.90	108.70	112.60	114.00	117.30	118.3
Per Capita Comparison (in Pounds)												
U.S.	534.5	549.20	563.90	576.80	583.20	595.40	571.60	598.30	593.50	584.60	591.40	N.A.
% Change with 1975 as the Base Year		102.76	105.50	107.91	109.11	111.39	106.94	111.94	111.05	109.36	110.65	N.A.
USSR	785.8	788.50	754.50	732.20	743.10	792.10	784.70	783.40	803.90	805.40	820.30	N.A.
% Change with 1975 as the Base Year		100.35	96.02	93.18	94.56	100.80	99.86	99.69	102.31	102.49	104.40	N.A.

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Dairy, Livestock and Poultry*, FD 1-89, June 1989; FD 1-88, November 1988; FD 1-87, November 1987; FD 2-86, November 1986; FD 1-86, May 1986; FD 1-85, March 1985; *Foreign Agriculture Circular: Dairy*, FD 6-76, December 1976; Economic Research Service, *World Agricultural Trends and Indicators*, 1970-88, Statistical Bulletin 781, June 1989; Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988 and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 13. Pork Production of U.S. and USSR in Recent Years.

Country	1974-78 Average	1980	1981	1982	1983	1984	1985	1986	1987	1988	Prelim. 1989	Forecast 1990
Aggregate Comparison (in Million Metric Tons)							(Carcass Weight)					
U.S.	5.9	7.50	7.20	6.50	6.90	6.70	6.70	6.40	6.50	7.10	7.20	7.10
% Change with the 1974-78 Average as the Base Year		127.12	122.03	110.17	116.95	113.56	113.56	108.47	110.51	120.58	121.63	119.83
USSR	5.2	5.20	5.20	5.30	5.80	5.90	5.90	5.90	6.30	6.50	6.60	6.70
% Change with the 1974-78 Average as the Base Year		100.00	100.00	101.92	111.54	113.46	112.60	113.46	121.62	124.54	126.92	127.88
Per Capita Comparison (in Pounds)												
U.S.	59.6	72.60	69.00	61.60	64.80	62.30	61.70	58.40	58.90	63.70	N.A.	N.A.
% Change with the 1974-78 Average as the Base Year		121.83	115.75	103.42	108.72	104.59	103.59	98.00	98.89	106.94	N.A.	N.A.
USSR	44.7	43.20	42.80	43.30	46.90	47.30	46.50	46.40	49.30	49.90	N.A.	N.A.
% Change with the 1974-78 Average as the Base Year		96.60	95.81	96.82	104.98	105.80	104.07	103.86	110.19	111.70	N.A.	N.A.

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-87, September 1987; *Foreign Agriculture Circular: Dairy Livestock and Poultry*, FL&P 1-85, April 1985; FL&P 1-86; March 1986; FL&P 2-86, September 1986; FL&P 2-88, October 1988; FL&P 2-90, March 1990; Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988; and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 14. USSR and U.S. Egg Production in Recent Years.

Year	USSR				U.S.			
	Egg (Total) Million Metric Tons	% Growth Rate (1975 as the Base Year)	Egg (Per Capita) Pounds	% Growth Rate (1975 as the Base Year)	Egg (Total) Million Metric Tons	% Growth Rate (1975 as the Base Year)	Egg (Per Capita) Pounds	% Growth Rate (1975 as the Base Year)
1975	3.23		27.9		3.79		38.7	
1976	3.13	97	26.8	96	3.80	100	38.4	99
1977	3.44	106	29.2	105	3.81	100	38.1	99
1978	3.62	112	30.5	109	3.96	104	39.2	101
1979	3.68	114	30.8	110	4.09	108	40.1	104
1980	3.79	117	31.4	113	4.12	109	39.9	103
1981	3.97	123	32.6	117	4.13	109	39.6	102
1982	4.07	126	33.1	119	4.10	108	38.9	101
1983	4.22	131	34.1	122	4.03	106	37.9	98
1984	4.27	132	34.2	123	4.04	106	37.5	97
1985	4.34	134	34.4	124	4.04	106	37.2	96
1986	4.51	140	35.4	127	4.04	106	36.8	95
1987	4.61	143	35.8	129	4.10	108	37.1	96
1988	4.74	147	36.5	131	4.04	107	36.2	94

Sources: Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 31-42, 1977-88, and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 15. Total Poultry Meat Production of U.S. and USSR in Recent Years.

Country	1974-78 Average	1980	1981	1982	1983	1984	1985	1986	1987	1988	Prelim. 1989	Forecast 1990
							(Carcass Weight)					
Aggregate Comparison (in Millions of Metric Tons)												
U.S.	5.3	6.60	6.90	7.00	7.20	7.40	7.90	8.30	9.10	9.40	10.00	10.70
% Change with the Average 1974-78 as the Base Year	124.53	130.19	132.08	135.85	139.62	148.40	156.60	171.79	177.89	189.28	202.13	
USSR	1.5	2.10	2.30	2.40	2.60	2.70	2.80	2.90	3.10	3.20	3.20	3.30
% Change with the Average 1974-78 as the Base Year	140.00	153.33	160.00	173.33	180.00	187.73	193.33	208.40	212.27	214.40	219.33	
Per Capita Comparison (in Pounds)												
U.S.	53.6	63.90	66.10	66.40	67.60	68.80	72.50	75.70	82.30	84.50	N.A.	N.A.
% Change with the Average 1974-78 as the Base Year	119.21	123.34	123.85	126.15	128.45	135.22	141.32	153.56	157.59	N.A.	N.A.	
USSR	12.9	17.40	18.90	19.60	21.00	21.60	22.40	22.80	24.30	24.50	N.A.	N.A.
% Change with the Average 1974-78 as the Base Year	135.18	146.85	151.91	163.07	167.77	173.43	176.89	188.74	190.30	N.A.	N.A.	

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-87, September 1987; *Foreign Agriculture Circular: Dairy Livestock and Poultry*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-88, September 1988; FL&P 1-90, January 1990; Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988; and U.S. Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States*, 109th ed., 1989.

Table 16. U.S. and USSR Grain (Wheat and Coarse Grain) Feeding and Total Output of Beef, Pork, and Poultry Meat in Millions of Metric Tons.

	USSR			U.S.		
Year	Grain Feeding	Meat Output	Feed Meat Ratio	Grain Feeding	Meat Output	Feed Meat Ratio
1980	114	13.9	8.2014	125.6	24.1	5.2116
1981	115	14.1	8.1560	131.2	24.5	5.3551
1982	112	14.3	7.8321	144.6	23.9	6.0502
1983	113	15.4	7.3376	130.2	24.8	5.25
1984	116	15.8	7.3417	141.6	25	5.664
1985	118	16.1	7.3291	142.4	25.6	5.5625
1986	125	16.5	7.5757	157.1	26	6.0423
1987	124	17.7	7.0056	153.6	26.5	5.7962
1988	126	18.2	6.9230	127.8	27.4	4.6642

Sources: U.S. Department of Agriculture, Foreign Agricultural Service, *Foreign Agriculture Circular: World Grain Situation and Outlook*, FG 4-89, April 1989; *Foreign Agriculture Circular: Livestock and Poultry Situation*, FL&P 2-83, May 1983; FL&P 1-84, April 1984; FL&P 1-87, September 1987; *Foreign Agriculture Circular: Dairy Livestock and Poultry*, FL&P 1-85, April 1985; FL&P 1-86, March 1986; FL&P 2-86, September 1986; FL&P 1-88, September 1988; FL&P 2-88, October 1988; FL&P 1-90, January 1990; FL&P 2-90, March 1990; Food and Agriculture Organization (FAO) of the United Nations, (Rome, Italy), *Production Yearbook*, Vols. 32-42, 1978 to 1988; and U.S. Department of Commerce, Bureau of the Census *Statistical Abstract of the United States*, 109th ed., 1989.

Table 17. U.S. and USSR Cotton Production Comparison.

	USSR			U.S.		
	Production (Million Metric Tons)	Harvested Area (Million Hectare)	Yield/Hectare (Metric Tons)	Production (Million Metric Tons)	Harvested Area (Million Hectare)	Yield/Hectare (Metric Tons)
1977-78	12.7	3.0	0.92	14.4	5.4	0.58
1978-79	9.9	3.0	0.87	10.9	5.0	0.47
1979-80	10.1	3.1	0.92	14.6	5.2	0.61
1980-81	14.3	3.1	0.98	11.1	5.3	0.45
1981-82	13.3	3.2	0.91	15.6	5.6	0.60
1982-83	11.9	3.2	0.81	12.0	3.9	0.66
1983-84	12.1	3.2	0.82	7.8	3.0	0.56
1984-85	11.9	3.3	0.77	13.0	4.2	0.67
1985-86	12.3	3.3	0.80	13.4	4.1	0.70
1986-87	12.2	3.5	0.76	9.7	3.4	0.61
1987-88	11.5	3.5	0.82	14.8	4.1	0.79
1988-89	12.6	3.4	0.80	15.4	4.8	0.69
1989-90	12.2	3.3	0.79	12.2	3.8	0.69

Sources: U.S. Department of Agriculture, Economic Research Service, *World Agricultural Trends and Indicators*, Statistical Bulletin 781, June 1989; Foreign Agricultural Service, *Foreign Agriculture Circular: World Agricultural Production*, WAP 2-90, February 1990; WAP 5-90, May 1990; WAP 2-89, February 1989; WAP 2-88, Feburary 1988; *Foreign Agriculture Circular: World Crop Production*, WCP 2-87, February 1987; WCP 2-86, February 1986; WCP 2-85, February 1985; WCP 2-84, February 1984; WCP 9-82, September 1982; and WCP 2-81, February 1981.